

AMERICAN FORESTS *and* FOREST LIFE



SEPTEMBER, 1924

MOVING LARGE TREES : : FLYING WOOD
THE BEAU BRUMMEL OF THE BIRDS

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Washington, D. C.

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AMERICAN FORESTS AND FOREST LIFE

(Formerly American Forestry)

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

OVID M. BUTLER, Editor

WASHINGTON, D. C.

L. M. CROMELIN, Assistant Editor

Vol. 30

SEPTEMBER, 1924

No. 369

CONTENTS

The Conflict on the Texas Plains—Max Bentley.....	515
With twelve illustrations	
The Beau Brummel of the Birds—F. R. Ott.....	521
With three illustrations	
The North Woods by Canoe—Louis L. Nichols.....	524
With five illustrations	
Moving Large Trees—Irving W. Payne.....	526
With ten illustrations	
The Forest Fire War in California—George C. Henderson.....	531
With six illustrations	
More Forests Needed for Paper.....	535
Camp-fire Stories by Forest Rangers:	
Psychology—Henry L. Spencer.....	536
Illustrated by North Stuart	
Photographic Helps in Starting Young Forests.....	538
Editorial	540
Flying Wood—Walter M. Moore.....	543
With twelve illustrations	
Flowers of the High Places, Part II—William Adams Dayton.....	548
With twenty-one illustrations	
Forest People:	
The Man Who Started Forest Protection Week—John D. Guthrie.....	552
With one illustration	
The Ranger Kiddie Contest.....	553
Photographs of Winners.....	554
Pine Pure or Pine in Mixture—A. C. Cline.....	557
With three illustrations	
In Summer—Poem by Alice E. Cartledge.....	559
With one illustration	
The Fire Situation in the West.....	565
Our Exhibit	566
With one illustration	
Around the States.....	567
Book Reviews	568

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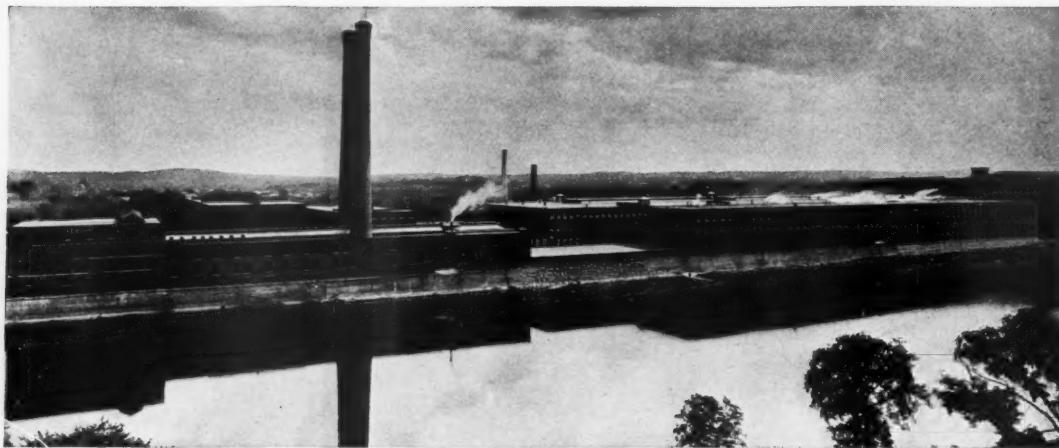
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Member A. B. C.

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A modern group of buildings of the "Standard Mill Construction" type

Three Reducible Items of Industrial Overhead

A message to Business Men about Weyerhaeuser-Ideal Industrial Construction

PROBABLY 50% of the industrial construction in 1924 is in position to take advantage of the Weyerhaeuser exhaustive researches into reducible industrial overhead.

Even with unavoidable costs as they are today, it is quite possible to save as much as 15% on capital building cost—thus lowering tax charges also.

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Save up to 75% on insurance charges.

The manufacturer who can control these three items will come closer to having the competitive situation in his own hands.

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"Fireproof" has been a word to conjure with.

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only 3½ cents per \$100 of insurance written.

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AMERICAN FORESTS

VOL. 30

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No. 369

The Conflict on the Texas Plain

*Where the Age-old Contest Between Trees and Drought
Rages Silently and Relentlessly*

BY MAX BENTLEY

Photographs by William L. Bray and the United States Forest Service

TREES!

Wandering through the forest, who has not laid his ear to some barky trunk and in his heart said, "Talk, old tree!" What tales they could tell, the "murmuring pines and the hemlocks!" What tales they do tell, to all who know the language of trees! Tales of conflict—always that. Tales of the never-ending battle of the trees, warred on by the predatory forces in Nature, warring on one another.

In this eternal strife the trees have but faithfully mirrored humanity's life and lived their own lives naturally and logically. Civilization itself has proceeded by steps of violence. The history of mankind has been built on war. The natural histories unite on a theme of conflict—the conflict of species, the mammal's violent ascendancy over the lower animal, and so on.

This sketch, a simple story about trees, an account of the losing battle for life waged by the Atlantic forest upon the dry Texas plain, borrows its

warlike conception from W. L. Bray, Ph. D., now Dean of the Graduate School of Syracuse University and formerly Professor of Botany in the University of Texas. "One may not inaptly speak of Texas," says Dr. Bray,

"as the battle ground in North America for the supremacy of plant races."

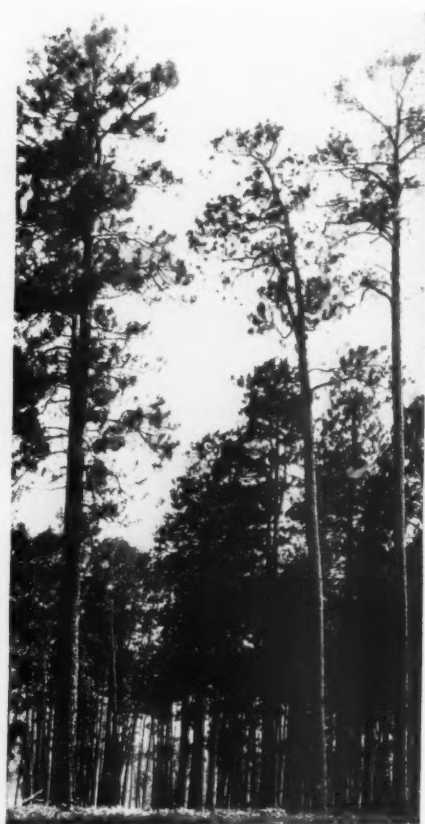
Acknowledgment is made to him for permission to use at will the material presented in his bulletins, and to Dr. Isaac M. Lewis, Professor of Botany of the University of Texas, for assistance in tracing the origins of particular species mentioned here.

Consider the field of battle.

The geographic range of Texas reaches to the edge of the tropics on the south, the wheat and corn belt of the Middle Western plain on the north, the swampy marsh of the lower Mississippi Valley on the east, and the broken canyons of the Cordilleran range on the west. Its climate embraces the extremes of moist warmth along the coast and the piercing dry winds of the mountainous interior. Its elevation is



"THE BALD CYPRESS AT BAY, IN DEFEAT TURNING NORTHWARD TO MISSOURI AND INDIANA, CASTING DESPAIRING EYES TOWARD THE DRY WEST, A PROMISED LAND HE CAN NEVER REACH"



"THE PINE FAMILY IS REPRESENTED BY THE STATELY SCALY-ARMORED LONG-LEAF, JOINING ON IN VIRGINIA"

In such diversity of soils one finds, among other species, nut pine, western juniper, and madroño from the Rocky Mountain region; mesquite, capote, lechuguilla, maguey, and a variety of other chaparrals and cacti from the Mexican highlands; cottonwood, sycamore, pecan, green ash, oaks, and even bald cypress from the Atlantic hinterland—all of the alien species competing for supremacy with the Texas mountain cedar, mulberry, hackberry, and Texas oak.

The meeting ground of the trees within Texas is the southern margin of the Great Plains, which along its entire length, from the farthest north in Canada to the southern ending in Texas, interposes a stern bar to the westward extension of the forest. It terminates abruptly in Texas on the Edwards Plateau, at the vast downthrow known geologically as the Balcones Escarpment, or fault-line. Erosion upon the body of the plains in that region has created the phenomenon of a picturesque mountainous country carved and transported and built up again on soft soils better suited to the growth of prairie, and to shade-loving trees, than to hardy mountain species. There are steep bluffs and deep gorges, isolated *buttes*, long and even slopes, upthrusts of granite and limestone boulders, and, by way of emphasizing the anomaly, lovely *mesas* knee-deep in grass, over which tiny mountain streams wander in lesiurely fashion to the sea. The

from the sea-level by diversified terraces to plains 4,000 to 5,000 feet high, and then to rugged mountains attaining an elevation of nearly 10,000 feet. From the sheer size of Texas, and through extensive erosion, soils of divergent type have resulted, including alluvial silt, waxy and sandy loams, red clay, black gumbo, powdered granite and limestone, and shale formations lying evenly a few feet beneath the surface.

whole area embraces about 15,000 square miles and lies mostly west of the ninety-eighth meridian, and consequently in a rainfall zone of less than thirty inches annually, decreasing progressively from east to west.

Such is the battle ground of the trees.

Three continental groups of trees have joined issue there with the native species for the right to live. One can only express the hope that in the end life will prevail. If the trees had but the manlike quality of joining forces against a common enemy, they might conquer; but they lack it, and therefore are trees and not men.

Broadly surveying it, the Atlantic forest had its beginning in the Appalachian range, in the same region whence sprang the beginning of American national history. Forest and ocean met there to exchange their tales of conflict and to war on one another. The trees came down to the ocean, which rushed up to meet them and throw them back. There was much to be said between them, and time was fleeting. A strange thing, that they have ever conversed and shared their secrets, yet are natural foes, always apart, always shrinking from actual contact.

With his tale of conquest the deep-voiced ocean thundered "Back! back!" The trees turned away. They turned first, vainly, toward that apple-scented land of tragedy which gave the world the story of Evangeline, where "the northern gale roaring over the hemlocks seals down the earth in silence" and raises before them a frigid and unbreakable bar. Next, vainly, westward. Only barren wastes lie there. Finally, southward, down the Atlantic, along a hinterland proffering



"HE IS THE BULL PINE (WESTERN YELLOW PINE), STALKING DOWN THE CANYONS AND BARREN SHOULDERS OF THE ROCKIES AND DESCENDING ON TEXAS WITH A CONFIDENT RESOLUTENESS"

abundant rainfall, low elevation, soft soils, and warm temperature.

The Atlantic forest arrives in force on the borderland of Texas, pulling up at the eastern bank of the Sabine River.

What an army it is! How vast! how surely invincible! The young birch is there, "delicately filming with the first green and spicy fragrant." Alongside—indeed. *push in* g ahead to bathe his knees in the water—is the bald cypress; and behind him the tupelo gum, the water oak, and the flowering magnolia. The hardy Greenland juniper is there, and he is soon to be engaged in a free-for-all against his western cousin, the Rocky Mountain cedar, and his Mexican cousin, the drooping juniper. The sturdy walnut family is represented by the black walnut from Ontario, the pig-nut from Quebec, and the water hickory from Virginia. Among the poplars and willows are the cottonwood from Quebec, to be engaged in time against his cousin, the native Texas cottonwood and the black willow from New Brunswick.

The white pine has dropped out, but the yellow pine, a recruit, now furnishes the largest complement of all. The pine family is represented by the stately scaly-



THE PALMETTO CROWDS TO THE WATER'S EDGE, AS A SENTINEL STANDING GUARD ON THE BORDER LINE OF TEXAS AND LOUISIANA

armored longleaf, joining on in Virginia; the shortleaf, from New York; and the loblolly, from New Jersey. From southern Ontario has come the sycamore. His buddies know him as Buttonwood. He is the tallest soldier in the army—taller even than the pines—and he is numerous, too. The older sycamores wear a weather-beaten uniform of reddish brown covered with platelike scales, while the young sprigs are done out in a secretive but gay grayish green. They are the ammunition-bearers. Countless little round balls dangle from smooth stalks, and their broadly ovate leaves have a hairy underside which, somehow, looks formidable. Not so tall and soldierly, but nearly as numerous, is the flowering dogwood from Ontario. He has shed his dress-parade uniform of white and is again attired in a business-like green. Bringing up the rear—stooped and weary, but still carrying on—is the Appalachian maple, to be seen now only here and there. He has traveled a great distance and is nearly ready to drop out (the truth is, he has been an unwilling soldier from the start), but, war being a bitter thing and no respecter of families, he will live to have it out with his cousin, the mountain maple from Montana.

The Atlantic forest disdains a halt on the Texas borderland.



THE ALLUVIAL HARDWOODS, AS THEY MARCH WESTWARD, REACH GREAT SIZE IN THE TRINITY RIVER BOTTOMS. ASH IS THE PREDOMINATING TREE IN THIS GROUPING



BETWEEN THE TRINITY AND THE SAN JACINTO THE WHITE OAK
LIGHTS UP MANY A SOMBER GLADE. AS IT MAKES ITS LAST
WESTWARD STAND



WHILE THE BRAZOS RIVER IS THE ABSOLUTE WESTERN LIMIT
OF THE LONGLEAF YELLOW PINE, THERE IS A STRIP OF LOB-
LOLLY PINE REACHING TO THE COLORADO RIVER



THE CEDAR BRAKE—A SURE SIGN TO THE TRAVELER THAT HE
IS ENTERING THE WEST, WITH THE PRAIRIE AND MOUNTAIN
NOT FAR AHEAD

The yellow pine and sycamore push determinedly to the front, to fall in behind the cypress, and, with the vanguard stringing along, the army crosses the wide Sabine without casualties. Leave them briefly on the west bank. For the present it suffices that they are in Texas.

From the northwest comes a counter-invasion. Sun-defying, rain-disdaining white pines, spruces, cedars, oaks, and locust stalk down the canyons and barren shoulders of the Rockies and descend on Texas with a confident resoluteness that bodes ill for the eastern army whenever the twain shall meet. Naturally the westerners are led by the "bull pine." He has come from British Columbia via California and Colorado. He is the *Pinus ponderosa* and at home grows to a height of two hundred feet. He will live to attain the farthest east of the western pine, but thus far has been matched, step for step and league for league, by his British Columbian neighbor, the Douglas fir. They are rightly proud, these two campaigners, since they are by now the lone survivors of the original western band. The Rocky Mountain white pine launched his invasion from Alberta, while the nut pine, the shin oak, and the locust were recruited in the foothills of the Rockies.

Most numerous of the westerners is the Rocky Mountain cedar. He is also the most adaptable, and consequently the wisest, of soldiers. Instead of hacking out a path by brute force, only to perish in the end, or turn tail and retreat (like his impetuous leader, the "bull pine"), he blends consummately into his environment wherever he may chance to bivouac, takes on its habiliments, and speedily becomes native, or at least adopted, stock. Thus he is closely akin to both the stubby Texas mountain cedar and the *Sabina virginiana* from Nova Scotia, largest and lordliest of the juniper family.

The Atlantic forest by now is proceeding westward. The march of the western species is southeastward. A third invasion has been launched—northeastward. It comes from the Mexican highlands. The entire chaparral clan has crossed the international line and is, at this moment, striking far beyond the Rio Grande plain. If the Atlantic forest has moved by steady marches, if the western army has pushed on without a pause, the Mexicans are traveling in ground-devouring strides. There has been nothing in biology more enthralling than the conquering of the treeless plain by the Sonoran pigmy horde. Forty or fifty years ago the Rio Grande Valley was an arid and treeless plain. Now its wooded area is vastly more extensive than the open prairie. The Rio Grande Valley is now truly a forested belt, and the only bar

raised with any degree of success against its encroachment has been the bar of aridity, reducing the species to shrubs.

The mesquite is always out in front as the dominant and strenuous species. What a campaigner he is! His spread northward and eastward has been a marked phenomenon. In twenty years he has moved in force one hundred miles. He has pushed confidently out into the desert, leaving in his wake mile after mile of prairie and plain securely won and reduced to the characteristic orchard-like landscape. He has conquered the lower half of the Staked Plains and along their eastern front passed over Oklahoma into Kansas. He has the soldierly quality of adapting himself to any condition, flourishing alike in alluvial bottom lands or on the hard, dry scratchings of the desert. He even invades swamps, sheds his axillary spines and fissured bark, and lives on as a river-adapted bean growth. The authorities mentioned in this account affirm very positively that under no circumstances nor in any environment does the mesquite yield a particle of his vigorous individuality; yet I believe I have seen him growing in swamps, changed greatly in appearance and looking positively sheepish, but himself nevertheless. Native, he is a shade-scorner and sun-worshiper, and like him in those respects are his followers on the march, both chaparral and cactus—the huisache, frijolito, lechuguilla, capote, and huajillo.

The three armies are converging on the Edwards Plateau for the final issue of arms. In the ensuing engagement the native Texas stock must be reckoned with. It is quite at home upon that field of battle and fully equipped to hold its own in any contest. As noted by Bray, "It is a dry-climate forest, since the aridity of the plateau is such as to exclude native species which love the cool twilight atmosphere of dense forests. Its growth is stunted, the wood dense and hard, the branches rigid, the foliage somber, the leaves small and stiff. The climate is written in every feature."

The catclaw and Rio Grande acacia are hardy campaigners, and so is that other member of the bean family, the retama. He is small and not much to look at, but his thorny armor is not to be trifled with. Then there are many assimilated species, both east and west, including the mulberry, hackberry, piñon pine, and numerous oaks. Although still bearing a resemblance to the ancestral species, they have adapted themselves to the climate of the dry Southwest and cast their lot with the purely native stock.

The trees have met. The issue is joined at last. The stage is set for an epochal and, alas! disastrous conflict.



"THE NATIVE POST OAK, GARLANDED WITH WREATHS OF MISTLETOE, AS IF IN TOKEN OF VICTORY; YET THE MISTLETOE IS SLOWLY STRANGLING HIM DOWN"



"PERHAPS BEYOND THE POST OAK, BEYOND EVEN THE YUCCA AND LECHUGUILLA OF THE DESERT, ONE WILL AGAIN COME UPON THE COTTONWOOD"



"LIKE SOLDIERS ON A LONG MARCH, THE TREES HAVE DRAWN IN THEIR BELTS, THEN SHRUNK TO BUSHES, THEN TO WAIST-HIGH SHRUBS, AND FINALLY TO A DESPAIRING VINE GROWTH"

Greatest of the army in numbers, the soft pine is among the early casualties—first the longleaf, then the shortleaf, and then the loblolly. The longleaf falls out at the Nèches River and the shortleaf at the Brazos. The loblolly effects a crossing of the Brazos and reaches the eastern bank of the Colorado before the predatory drought strikes him down. A pathetically small strip of woods along that stream marks the farthest western bivouac of the eastern yellow pine.

The bald cypress has made an epochal advance. Shaking the water from his knees, he has crossed the plains in great strides, only to be halted in the valley of the Nueces River. He is to be found there now, at bay, in defeat turning northward to Missouri and Indiana, casting despairing eyes toward the dry West, a promised land he can never reach. He has actually taken on some of the appearance of the semi-desert growth; his water-absorbing knees are disappearing; but it is not enough yet. He has fallen short in his effort and definitely dropped out of the western march.

changes his coat—indeed, his whole appearance—as he advances westward. When he becomes the mountain red cedar the West claims him as native. Below the Rio Grande he is known as the drooping juniper, a definitely identified Mexican product. Let his ancestral home be where it will, it has been said that when the cedar's smooth bark begins to show scales the mountain is not far ahead.

The Atlantic forest has been dispersed; only scattering remnants advance here and there, seeking the trickling waters of streamways and hidden mountain springs, without which they cannot live.

Beyond the one hundred and second meridian one can truly say farewell to the forest. Perchance it will be the native Texas post oak, marking the farthest advance of any tree of any species. Perchance he will be garlanded with wreaths of mistletoe, as if in token of his victory. The drought has failed to stop him, wind has failed to lay him low, worms have failed to topple him; it remains



ON THE FIELD OF HONOR THE MESQUITE IS OUT IN FRONT, DOMINANT AND STRENUOUS. HE HAS THE SOLDIERLY QUALITY OF ADAPTING HIMSELF TO ANY CONDITION

The palmetto is another early casualty. Mention of him brings a picture of this familiar brittle fanlike growth. Along the Sabine and Nueces and Trinity rivers the palmetto was last seen crowding to the water's edge, like a sentinel standing guard. He was more than that; he was a determined soldier; but not far from the border line of Louisiana and Texas he made his last westward stand. Beside him fell the swamp species of gum, oak, magnolia, and birch.

Like the course of empire, the march of the Atlantic forest across Texas is westward. Among the alluvial hardwoods the ash predominates, yet he is scarcely ever seen fifty miles beyond the Trinity River. The white oak outdistances him, and between the Trinity and San Jacinto rivers lights up many a somber glade before he passes out. The sycamore outdistances the white oak. Shrunk and tattered, he pitches his last camp on the Devil's River, on the very edge of the dry plain.

Beyond the big rivers is the cedar brake. The cedar is a valiant campaigner, too, but unlike the mesquite,

for the beautiful mistletoe—beautiful, but always a parasite—to slowly strangle him down in the hour of his triumph.

Perhaps beyond the post oak, perhaps beyond the yuccas of the desert, one will again come upon the cottonwood. He does not look altogether eastern (a cold and discriminating eye might question his eastern origin), but the temptation is irresistible to identify him as the Marshall, that indomitable *voyageur* from Quebec, and to take off one's hat to him and hail him the lone survivor of the Atlantic forest. He is making his last stand in the mountains. In that wild, rocky, lonely land he has wrought an epic, because he has grown so luxuriantly. It may be his last effort, but he has risen to it superbly and he now defies his enemies. Farther west, across the Arizona Desert, he again appears as a healthy going specimen, but his course appears to be eastward. There he must be, surely he is, the Fremont cottonwood, east-bound from California. Will the westbound and east-bound cottonwood ever meet in the desert's heart?



THE RUBYTHROAT—THAT VIVID, PULSATING BIT OF A BIRD, SELDOM SEEN OTHER THAN ON FLASHING WING—ON GUARD AT HIS TINY NEST

The Beau Brummel of the Birds

By F. R. OTT

With Photographs by Fred Richards

ONE day my boy scouts brought me something tenderly laid in a small box and carefully nested in cotton. I held the box in my hand and beheld one of the most perfect gems of all bird life—the ruby-throated humming bird. For the first time I now had intimate opportunity for the closest observation covering the dazzling details of that flashing beauty so often seen on poised wings among the honeysuckles in my garden. Here, indeed, was the luster of the topaz, the emerald and the ruby, unafraid and lying close to my palm; the tiny heart beating with minute rhythm and telling of the pain it suffered from a broken wing. For so the boys had found it at the bottom of a lilac bush. In describing the dainty humming bird one of the older poets has said:

"Still sparkles here the glory of the west,
Shows his crown head, and bares his jeweled breast,
In whose bright plumes the richest colors live,
Whose dazzling hues no mimic art can give,
The purple amethyst, the emerald's green,
Contrasted mingles with the ruby's sheen."

In eastern North America we are acquainted with just one species of the humming-bird tribe, and that the ruby-throated. For this reason many of us are possibly misled into believing that no other member of the family exists. It is a matter of record that about five hundred species of these little birds have been tabulated, but I doubt whether any of the other species could be more strikingly beautiful than ours at the height of the breeding season, when decorated in gorgeous plumery.

The adult male bird is about three and one-half inches in length, with a body of a very dark golden green, wings of brownish purple tipped to green on the shoulders, and all of this contrasted with a throat adornment of deep tinted ruby reflecting a background of changing gold. The white patch of the belly sets off this throat band to the constant admiration and wonder of one who may observe the bird from a point of vantage, for—

"Each rapid movement gives a different dye;
Like scales of burnished gold they dazzling show,
Now sink to shade—now like a furnace glow."

Often I have watched the little birds from my window; not only to observe their maneuvers among the blossoms, but to be amused by their peeking in through the glass; poised on wings almost invisible or like a mist, and the long beak with a gentle or perhaps angry tap tap on the panes.

Then again I have seen him, this Beau Brummel of the bird world, arranging with neatness and activity the whole of his jeweled robes when perched on a slender branch. There one will sit moving sideways in prettily measured steps, pluming and stroking, opening and closing and spreading one wing at a time as if to bring a sun-beam in direct contact with an almost transparent pinion.

And again I have seen one as the attacking knight, pugnaciously driving off all intruders and not infrequently forcing battle against the kingbird which seems to stand in awe of their slender, rapier-like beaks. When angry or under the influence of fear, humming birds become very violent, and in flight as rapid as an arrow, so rapid, indeed, as to be almost invisible. In the breeding season they attack with perfect fury, darting at the eyes of the larger birds and uttering in the whirlwind of their attack shrill, squeaky war cries. It is interesting to note how this might substantiate the words of an ancient writer on bird lore, Fernando Oveido, who confirms their boldness by saying:

"When they see a man climb the tree where they have their nests, they flee at his face, and stryke him in the eyes, commying, goying, and returnyng, with such swift-ness, that no man woulde ryghtly believe it that hath not seen it."

This quaint exaggeration may have its place under certain circumstances, but I personally have never seen an example of it. The greatest interest, however, may be derived from watching the bird as a home builder. It is perhaps rare that one has such a privilege, but when it comes a few hours of watchful waiting are well repaid. A constant search for such an opportunity may eventually be rewarded, but surely not

more than once in a lifetime will a rubythroat be so accommodating as to bring this occupation to your very window. It was our great good luck to have one build a nest in a vine which twined itself up over the screening. In this performance you are actually seeing the tinst of masons at work, for the bird uses her slender beak as a trowel. First she brought a tiny pile of small grass and commenced to securely fasten this on a creeper which was less than a quarter of an inch in diameter. This work was carried on below a leaf which eventually entirely concealed the finished nest. The foundation thus laid was securely cemented to the tendrils by a thin coat of mucous glue. The rest of her materials were now brought every few minutes and each little pile skillfully adhered to the former while she smoothed and rubbed to and fro with amazing dexterity, coating the particles with saliva. The completed nest was about an inch in diameter and the exterior coat formed of lichen. In the orchard or bushes surrounding our home, such a tiny nest is all but invisible; the finished dwelling blending softly to the twig or tree and appearing for all the world as a wart or excrescence on the bush.

The rare pictures accompanying this article represent the work and photography of my friend, Mr. Fred Richards, of Brockport, N.Y.

To obtain these pictures he exhibited the patience of the proverbial Job. And yet the effort was well rewarded, not only in the finished exposures but also by the knowledge gained through such intimate contact with and study of this feathered sprite. The photography required from four to five weeks of patient watching and waiting from a specially



AN INTIMATE AND UNUSUAL STUDY OF HOME LIFE WITH THE RUBY-THROAT—THE COMMISSARY DEPARTMENT IN ACTION

pared ladder and blind, by means of which Mr. Richards was able to approach within three feet of the nest. It was almost by accident that he discovered the tiny bird building a nest near his home. The initial desire was to obtain, if possible, a picture of the bird busy at nest building. But before the ladder could be obtained or erected

the home was built. And then as the bird hovered around the photographer, it became apparent that eventual tameness and friendship might make it possible to obtain a series of snapshots. It was thus after some forty exposures he was able to photograph nest, bird and family through the entire period of incubation. According to expectation, and as verified by other ornithologists, only two eggs were laid in the nest. Eventually one only hatched. The entire period of incubation, by actual count, occupied eleven days, and in less than three weeks the tiny, almost insect-like young was ready to fly with the mother.

Of the photographs shown, the one showing the mother feeding her young is possibly the most remarkable. The bird became quite accustomed to Mr. Richards, although at each click of the camera she would dart off in alarm, to return to watch shyly and perhaps with amusement her curious intruder.

Many people think that the humming bird derives sustenance almost entirely from the nectar of flowers, but from these observations it appears that the rubythroat is also insectivorous, feeding the fledglings on tiny insects in the usual bird way. Of late I have watched for this mode of sustenance, and observed the bird for half an hour at a time apparently dancing in the air while attacking little groups of insects with quite as much ferocity and dexterity as any of the flycatchers.

The wounded captive brought to me by the boy scouts

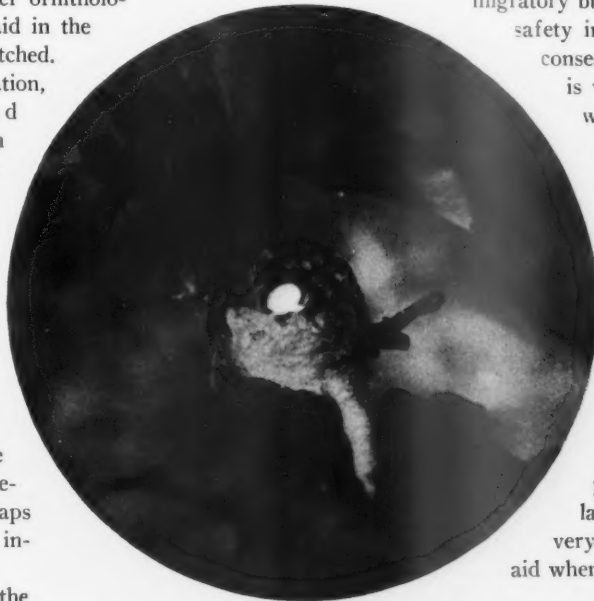
gave me the opportunity to observe at close range some of the interesting features of its delicate structure. The wings are large and apparently at first glance entirely out of proportion or at least not in accord with our idea of symmetry in so small a creature. And yet the utility

of their design is obvious, for this bird is not only migratory but is dependent, as a matter of safety in attack, on quick action, and consequently extreme wing power is vitally important. The tongue which the bird would thrust out when we tried to feed it sugared water proved to be very long and retractile and would dart out with considerable force. I have since learned that the tongue is evidently composed of two muscular tubes which act as straws when the bird is in search of honey essence. The feet are most delicate but well proportioned, the claws rather large, very much hooked and very sharp, and so a substantial aid when the bird is clinging to things.

We made an attempt to keep our wounded pet alive by feeding it honey dissolved in water. For several days we were suc-

cessful. But eventually the confinement defeated our efforts and the little bird died. In some countries, however, the birds have been caged and kept as household pets with success. And yet, in my opinion, such a beautiful, brave warrior might better be left to its natural environment where—

"Small as a beetle, as an eagle brave,
In purest ether he delights to lave;
The sweetest flowers alone descends to woo,
Rifles their sweets, and laves in honeydew."



THE EGG, LIKE A SMALL PEARL GLEAMING IN THE TINY NEST



Recreation Congress to Meet in Atlantic City

THE Eleventh National Recreation Congress has been called by the Playground and Recreation Association of America in Atlantic City, October 16 to 21, 1924. The Chalfonte-Haddon Hotel will be headquarters. Outdoor subjects will receive the most attention on the program.

The speakers' list includes Joseph Lee, of Boston, President of the Playground and Recreation Association of America; Theodore Roosevelt, Assistant Secretary of

the Navy and Executive Chairman of the President's Outdoor Recreation Conference; Peter W. Dykema, of the University of Wisconsin; William E. Harmon, of New York City, President of the Harmon Foundation; Lester F. Scott, of New York City, Executive Secretary of the Camp Fire Girls of America; Joseph P. Day, of New York City, and Dr. Allen R. Ireland, Director of Physical Education and Health, Hartford, Connecticut.

The North Woods by Canoe

By LOUIS L. NICHOLS

IN THESE DAYS when scientists have proved the tendency of all living things to "revert to the type," it is easy to understand why the savage instinct, which goads the boy to kill Indians, impels the boy's father to look forward to the time when he can exchange the desk, or the counter, for a tent in the woods; yet, innate and innocent as this desire seems, it is seldom gratified.

The man often misses his bit of freedom because he does not know how to go about it. He has no camp equipment, no experience in roughing it, no congenial companion to accompany him, and no information. It is in the hope of helping some such latent savage back, for a time at least, to his first estate that this little account of the canoeing trip taken by a friend and myself is written.

No better summer playground can be found than the North Woods. Thousand of acres of primeval forest, eighteen hundred lakes, and a network of rivers almost completely connecting these lakes render the Adirondacks an ideal region for camping and canoeing, while the prosaic but useful railroad makes every point of departure accessible.

The Fulton Chain of the lakes is entered at Old Forge by way of the New York Central road from Utica. When it is remembered that even twenty-five years ago

these lakes were still as Cooper knew them—if, indeed, Cooper ever penetrated so far—it will not seem strange that guides can still be secured at almost any point—men who have spent their lives in the woods, are skillful in fishing, hunting, canoeing, camping, and all woodcraft, but who in these days find the tourist easier and more profitable game than woodcock or deer.

Such a guide furnishes a boat, rows it, carries it when necessary, and, if desired to do so, provides camp equipment and cooks the meals. If, however, the "reversion to type" does not amount to a paroxysm, the camper probably will be satisfied to eat his broiled fish over the noonday camp fire and to seek the shelter of some comfortable public house for dinner and a night's lodging. Should he follow this plan, he will wear heavy shoes, an outing suit and sweater, and his "kit" will consist of nothing beyond a few necessary articles and a raincoat.

Indeed, the guide is a convenience rather than a necessity. If one is willing to carry his own "kit," including the canoe at the carries, and enjoys paddling it, literally, he can do very well alone. If two take the trip together, it is still easier to do without the guide. Government maps of sections of 10 miles square, covering the entire region and so detailed that every creek and forest trail is given, can be obtained from the Geological Survey at Washington for five cents each. Provided with these maps, the "reverter" will have no difficulty in finding his way from Utica to Plattsburg and back again.

Our own trip began at Inlet, the upper end of Fourth Lake of the Fulton Chain. The start could have been made at Old Forge as well, thereby adding four lakes to our collection. It was the middle of August, a particularly desirable time, because one then escapes the worst heat of the lower levels and



NOT THE PICTURE OF A RETREATING "SNUFFWALLOPER" OR OTHER PREHISTORIC CREATURE, BUT THE "CARRY" BETWEEN SEVENTH AND EIGHTH LAKES



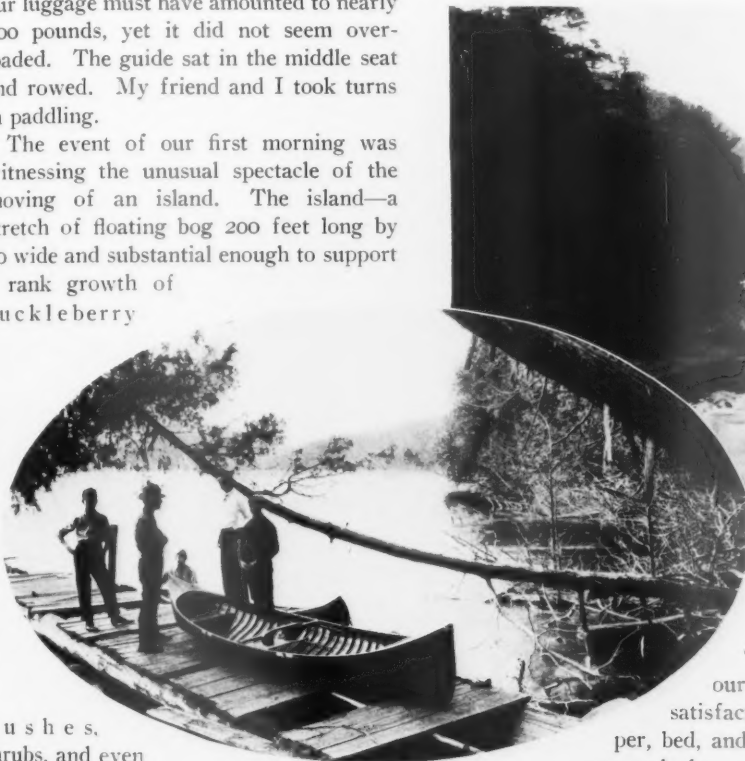
DEEP GREEN WATER, MAKING A PERFECT MIRROR TO THE TANGLE OF FERNS AND SHRUBBERY ALONG THE CURVING BANKS

because the mosquitoes and black flies, the insect pests of the North Woods, disappear with June and July.

Our canoe was really not a canoe at all, but an Adirondack guide-boat. It weighed only about 60 pounds, and was so slender and pointed that it slipped easily through the water, while it surpassed the canoe in steadiness and strength. Our combined weight with our luggage must have amounted to nearly 600 pounds, yet it did not seem overloaded. The guide sat in the middle seat and rowed. My friend and I took turns in paddling.

The event of our first morning was witnessing the unusual spectacle of the moving of an island. The island—a stretch of floating bog 200 feet long by 50 wide and substantial enough to support a rank growth of huckleberry

we reached "The Antlers" about noon, prepared to do justice to one of the best of dinners. Raquette Lake is one of the largest of the Adirondack lakes. It may be reached by railroad and is the entrance to many fine private camps. For us it was a broad highway to Forked Lake and the Raquette River. Where this river flows into Long Lake,



A PLEASANT HOUR OR SO WHILED AWAY WITH A CHANCE ACQUAINTANCE

bushes, shrubs, and even half-grown trees—had suddenly changed its position so that it completely closed the channel between Fifth and Sixth Lakes. Just as we arrived the little steamer was ramming it, head on, nosing it back to its proper place, much as a steamtug performs the same office for the ocean liner when it comes into its slip.

On we paddled through Fifth, Sixth, Seventh, and Eighth Lakes of the Fulton Chain, with a carry of a mile and a half between the Seventh and Eighth. These Fulton Lakes are like eight fair sisters; there is a striking family resemblance, yet each has her own fascinating personality.

Eighth Lake differs from the others in having no cottages on its banks, due to its being a State reserve. We remarked, too, a peculiar appearance of the trees bordering the lake. They looked as if the lower branches had all been trimmed evenly to a certain height. Our guide told us that this trimming was done by the deer, who browse from the ice in winter. The wild creatures seem to appreciate the fact that Eighth Lake is still theirs, while the others have been appropriated by man.

Another carry of about a mile, and a little stream, called Brown's Inlet, brought us to Raquette Lake, and



A BREAK IN THE TREES DISCLOSED A BLUE, CLOUD-TIPPED MOUNTAIN PEAK IN THE DISTANCE

we stopped for the night, again seeking "the civilization of the provinces," to use our schoolboy phrase. To our complete satisfaction, "civilization" took the form of supper, bed, and breakfast at a hotel. The next morning we pushed—or rather "pulled" on down Long Lake, past a camp of swimming, canoeing, yelling boys, into Raquette River.

This river is even more beautiful than the lakes, because it offers more variety and is full of delightful surprises. Every turn reminds one of the slogan "Kodak as you go," and we were not slow in following the suggestion. Now it was a deep, green pool, making a perfect mirror to the tangle of ferns and feathered bushes on its bank, then it was a break in the trees with a blue cloud-tipped mountain peak in the distance. For a few rods a gentle descent would make a ripply surface that would suggest brook trout and raise the question of the possibility of a spring vacation, and again a pile of blackened stones with a discarded tin can or two told us that we were not the first to come this way and that was an ideal spot for a camper's luncheon. At times it stretches for miles through meadow lands, shaded not by thickets, but by spreading oaks and maples, and flowing so smooth, so strong, so deep, that it seems more like an English river bordering some great ducal estate than like a wild creature of the forest. It was with regret that we bade it good-bye at Axton, where we spent our second night.

Axton is one of the camps, once so common in the North Woods, that exults in its distance from a rail-

[Continued on page 542]



Courtesy Isaac Hicks & Company

Moving Large Trees

Through the Development of This Art Decades May Now Be Spanned in Landscaping for Immediate Effect

BY IRVING W. PAYNE

Landscape Architect, Office of Public Buildings and Grounds, Washington, D. C.

THERE is an ancient saying which runs something like this: "It is impossible to transplant an old tree with success." The Greeks or Romans, in designating anything as impossible or exceedingly difficult of accomplishment, commonly said that it was like transplanting an old tree. This ancient adage and the belief back of it are now in the discard, for modern science has pretty well solved both the mechanical and physiological difficulties of removing large trees from their native sites and transplanting them as man disposes.

By large trees reference is made to trees which in some cases have reached their full stature and in others have attained growth in height of thirty, forty, fifty, or even as much as eighty feet. In many sections of the country today, particularly in the East, it is not an uncommon sight to see trees of these dimensions being moved on great trucks through city streets, destined to adorn local parks or private property. Not so many years ago the

purchase of large trees for the purpose of beautifying home grounds, and so stealing a march of thirty or forty years on Nature, was considered a luxury well beyond the reach of the average man; but the art has now been developed to such a practical point that it is no longer a rich man's exclusive privilege.

Nor can it be considered a hobby, because the practical service provided by landscape organizations making a specialty of transplanting large trees adds an immediate property value which one would otherwise have to wait twenty-five or thirty years to realize. It is generally conceded that grown trees enhance the value of real estate, particularly when artistically arranged to give a restful and inviting atmosphere to the home.

Where trees are not growing naturally on the land selected for a new home, the average builder completes his house and then starts to beautify his grounds by the planting of young trees. But a home is not really fin-

ished until the trees and shrubs in the yard have reached a certain growth, and the salable value of the property is materially affected by the development of these trees. A porch or an addition to a house can be made within a few weeks, and sometimes enhances its value by several thousand dollars, but where shade trees are not already growing, there is little the owner can do to hasten materially the growth of young trees newly planted. Figuratively, he must sit down and wait until Nature, in her methodical way, has added stature to the trees, and they in turn have added value to comfort, beauty, and dollars and cents to his home property.

Many a home is bought because of the trees in the yard. Just how much trees actually add to home property values naturally depends upon a great many things. The character, size, and beauty of the trees and the taste of the prospective buyer, etc., all enter the question; but there are plenty of cases where full or partially grown trees have added thousands of dollars to the intrinsic value of property. The accustomed thought is that, in the absence of natural trees, we must plant young trees and wait for Nature to develop them; but this

see a beautiful tree in a neighboring field and exclaim, "I would give a good deal to have that tree in my yard!" Perhaps we exclaim in somewhat the same negative spirit in which the Romans used the old adage. As a matter of fact, it may be entirely possible and practicable for us to have that tree taken up bodily and transferred to our own yard. It is being done every day by men skilled in the work, with apparatus especially designed for the purpose. If the tree is not too large, it can be moved by men who understand their work, with teams and trucks, and the expense may not be beyond our reach, for modern developments in the art of moving large trees have served to make it possible to perform the work with assurance of success and more cheaply than in the past. Trees as large as 14 to 24 inches in diameter and 40 to 70 feet high, with 30 to 50 feet spread of branches, can be successfully transplanted.

But the practice of moving grown or partially grown trees is by no means new to the twentieth century, nor can it be considered unique in modern times. Man has apparently been attempting to move trees from time immemorial. There are references in literature to the Romans



Lewis & Valentine

THIS IS AN ELOQUENT EXAMPLE OF WHAT MAY BE ACCOMPLISHED THROUGH THE USE OF LARGE TREES IN SECURING AN IMMEDIATELY BEAUTIFUL LANDSCAPE EFFECT. IT IS THE TERRACE ON THE RALPH CREWS ESTATE

does not necessarily follow, for the planting of large-sized trees today is a logical item of cost to be considered in the completion of the home. For example, in planning a house to cost \$10,000 or \$20,000 one should consider the expenditure of a few hundred dollars in addition to cover the planting of a half-dozen good-sized trees to shade the porch or add beauty to the setting. Indeed, one can often save expense in grading and immediately improve the landscape effect by moving large trees and shrubs rather than soil, provided the trees are skillfully arranged to give solid masses of foliage.

As we motor along country roads, how often do we

seeking to get immediate landscape effects by removing trees of large size, thus anticipating the slow progress of time. It appears that they sought not only to transplant large trees, but actually reset trees which storms had blown down. But the art, if such it may be called, seems not to have

progressed in the hands of the Romans, and the assumption is that they were not very successful as movers of large trees. Nor does any great progress seem to have been made in modern times until the latter part of the last century. There are numerous references in history to outstanding instances of moving large trees, but the



1—This is a series of pictures made by the Office of Public Buildings and Grounds at Washington, D. C., during the transplanting of some of their large trees on public sites. This illustrates the first move—digging around the tree, preliminary to trenching, before its removal from the original site.

effort seems to have been in vogue mainly, if not altogether, among the rich and powerful and attempted as a display of expense—executed without plan, science, or skill.

Louis XIV of France is said to have been one of the greatest transplanters of modern times, and his example stimulated the art in Europe in the 17th century. Learning that the practice was known to the Greeks and Romans, Louis XIV determined to outdo them. In a book written in 1828, Sir Henry Steuart tells of Louis XIV's determination to move a forest, as follows:

"Accordingly, among the stupendous changes which he made on the face of Nature at Versailles, and other royal residences, that by means of transplanting was not omitted.

All the arts of ingenuity and all the efforts of expense and labor were employed in constructing machinery for so novel an undertaking. Under the directions of Le Notre, his favorite engineer in this department, the most extraordinary feats in transplanting were performed, both at Versailles and Trianon. Immense trees were torn up by the roots, erected on carriages, and removed at the will and pleasure of the royal planter. Almost the whole Bois de Boulogne was, in this way, said to be transported from Versailles to its present site, a distance of about two leagues and a half. To order the march of an army was the effort of common men and every-day commanders; to order the *removal of a forest* seemed to suit the magnificent conceptions of a prince who in all his enterprises affected to act upon a scale immeasurably greater than that of his contemporaries."

But from the Romans to the 19th century the work of transplanting large trees seems to have been an art which outgrew few of its first crudities. Trees were badly lop-



2—After digging, the great "ball" of earth about the tree is "blocked up" with timbers. This shows detail of method of opening soil under the plant preparatory to completion of "blocking."



3—Thoroughly protected, balled and blocked, and on its heavy plank platform, the tree is ready to start on its journey.

ped and mutilated and the main effort toward skill shown was in devising methods of transportation. It is interesting to note that these early tree-movers were possessed with the idea that a large tree must be moved upright—that is, standing vertically, just as it grew—which belief naturally increased the problem of transportation. Some of them even asserted that the tree must be planted in exactly the same position with respect to the compass as it originally grew, and that if it leaned slightly to the north, for example, it must be replanted with that same tilt. How many trees thus moved subsequently died history does not say, but the mortality must have been very heavy indeed.

While the technique of these early tree-movers seems not to have been preserved by history, the methods employed by some of the later landscape men are available. Extensive reference is made to the subject in "Sylva," by Sir John Evelyn, published in 1607.

The moving of a large tree is a radical operation in the

life of the tree, calling for skill and modern equipment to assure success. While the average citizen, with a few instructions, can usually transplant successfully a small tree, the moving of full or partially grown trees is today a highly developed science, a development which seems to have responded to the American characteristic of getting what they want. When it is considered that a large tree, as taken from the ground under modern methods, may weigh thirty tons or more, something of the technique, skill, and equipment needed in its transportation may be imagined. Many machines for this work have been developed in years past, tested and discarded or improved upon, until, out of the experimental efforts, the machines best adapted to perform the work successfully and economically have come.

The mechanical phase of moving large trees is, however, less important than the surgical phase, viz., the critical operation of removing the tree from the soil and



4—The plant has been rolled onto the truck by means of the long timbers, or "skids," shown in the preceding picture, and securely bolted to its platform to prevent slipping.



5—Arrived at its destination, the operation is reversed, and the big tree is lowered into position by use of a "block and fall" to control the momentum and eliminate injury.

the subsequent protection of its growth during recovery from the shock. Here, indeed, is a major operation among trees. Both roots and branches must be cared for with utmost skill. Treatment of the roots is considered especially important. In ancient times both the roots and limbs were trimmed back to within a few feet of the trunk, but modern science seeks to preserve as much of the root system of the tree as practicable. Some trees, depending upon species and size, can be moved by leaving their root system in a center ball of earth six or eight feet in diameter. Some operators, however, believe in preserving a larger portion of the tree roots. One company in New York, for example, follows the practice of digging around the tree fifteen or twenty feet away from its trunk, undercutting, and then dissecting out the roots from the soil. As the roots are uncovered they are tied in bundles and bent upward. Finally they are straightened out and tied up again, as shown in one of the photographs, so as to

insure thorough protection against injury in transportation.

The time for moving large trees varies somewhat with the climate, soil, the species of the tree and conditions of local roads. The usual time for moving broad-leaf or deciduous trees is in the fall or spring, but large evergreens may be moved practically any time during the year, although here, too, the fall and spring, and the winter throughout the south, are considered preferable seasons.

Some of the trees especially adapted to transplanting when of large size are the American elm, English elm,



6—Its travels over, the tree is placed in the hole prepared for it by the side of the Lincoln Memorial. Due to the care used, it is interesting to note that these operations have been conducted with a minimum of loss.



Courtesy the Amawalk Nurseries

THIS BIG ONE IS GOING OUT BY MOTOR TRUCK, UNDER THE IMMEDIATE PERSONAL SUPERVISION OF MISS EVELYN SMITH, PRESIDENT OF THE AMAWALK NURSERIES AND A KEEN ENTHUSIAST ON THE SUBJECT OF MOVING BIG TREES

lindens, American beech, locust, birch, dogwood, American holly, white pine, willow, poplar, Sugar and Norway maples, red cedar, wild cherry, and horse-chestnut. All of these trees are considered fairly easy to move. The oaks, with the exception of the pin oak, the hickories, and walnut and beech are less easy to move. The pin oak, however, can be transplanted successfully without much difficulty, and the same is true of most of the evergreens.

In considering large trees for planting on your property, the selection of species is important. One can, of course, leave this question to his nurseryman, but on the other hand there is a certain amount of sport to be derived from scouting the countryside in search of the partially grown tree one wishes to make a part of his home surrounding. There is a satisfaction, too, in being able to select just the kind of tree desired, and thus get at once the harmonious landscape effects held long in the mind's eye.

Individual trees, designed for immediate landscape use, can usually be purchased from farmers and owners of wild land, once they have been located. If the farmer holds his tree at an exorbitant price, one can usually "shop around," so to speak, until he strikes a bargain. He can then get in touch with a landscape organization equipped to pick up the tree from the farmer's

lane side or field and set it down under his own window.

In thus selecting trees, there are certain points to be considered, the chief of which is soil. A tree growing in a deep, loamy soil can be easily dug out, while one growing in rocky earth is apt to have its roots grounded and will probably be injured during the extracting process. The age and physical condition of the tree must also be considered, although advice on this point seems superfluous, because the average person will naturally select a thriftily growing and well-shaped tree. The general appearance of the tree, particularly in the summer time, and its growth at the top are good indications of its health. A mistake is apt to be made if large trees for planting are selected from crowded woods. Such trees are usually fighting for their existence, and often their root systems are small and the lower limbs weak, with the result that if they are taken out and transplanted they sometimes resemble a pole more than a tree.

The present-day science of transplanting performs a valuable service in thinning out groups of trees planted years ago which time has proven were planted too closely together. Of course, one can thin out such trees by merely sawing them down, but this entails the loss of perfectly good trees, which modern tree-moving machinery and skill could save by transplanting to another part of the yard or estate. "Plant thick, thin quick!" was a much-

[Continued on page 560]



Lewis & Valentine

THIS CLEARLY INDICATES THE CARE EXERCISED IN PRESERVING THE ROOTS OF LARGE TREES IN PROCESS OF REMOVAL, IN ADDITION TO MAINTAINING A LARGE BALL OF EARTH IN WHICH THE TREE HAS BEEN GROWING



The Forest Fire War in California

BY GEORGE C. HENDERSON

With Photographs by the United States Forest Service

WAR has been declared in California. As this is written, troops are being called out; airplanes are being held in readiness; more than 700 men have been enlisted; citizens committees have been organized and are taking subscriptions; daily bulletins are being issued from official headquarters. Certain areas on the battle front have been closed to visitors, sentries in khaki, with guns on their shoulders, patrol threatened regions and war songs are being sung at patriotic meetings.

Aroused by a menace that threatens its water supply, playgrounds, forage, timber and sources of hydroelectric power, California today is organized to fight, not a human enemy, but the red terror of the forests—fire.

With the wooded and mountain sections of the State parched by an unprecedented drouth, the destruction of timber by forest fires

on the National Forests of California has reached a point 626 per cent higher than for the same period in 1923, and the peak period has not yet arrived. In 1923, from July 1 to July 20, there were 534 fires, which burned over an area of 23,189 acres. Only 62 of these fires destroyed

more than ten acres of growth. This year, for the same period, there have been 830 fires, while the area covered is nearly eight times as large, being 168,489 acres. The number of fires that spread over an area in excess of ten acres jumped from 62 in 1923 to 214 in 1924, indicating that the fighters are having much more difficulty in gaining control. In fact, one fire of every four that have started this year has got beyond control of the first group of fire-fighters to arrive, and



THE MAGIC WATER BAG

While tired, thirsty men take a moment's respite on the battle line and gain renewed strength from a long, cooling drink. Fire-fighting draws heavily on ingenuity, brawn, and endurance.

has swept over a big territory, due to the dryness of the brush, leaves, and pine cones. Blazes which in ordinary



THE ADVANCE OF THE ENEMY

Splendid stands of mature pine must be saved from roaring California ground fires, which kill and weaken the trees and destroy the ground cover that protects the state's water supply.

times require only one or two men to handle now regularly require large crews, ranging from ten to five or six hundred.

This, in a word, is the menace that early in August threatened timber resources valued at \$750,000,000, and that had stirred the Federal, state, and civilian authorities to unite into a fire-emergency organization that included the U. S. Forest Service, the State Board of Forestry, the California development associations, lumber, water, cattle, land, and recreation interests, and that called on the U. S. Army for aid and upon the public for funds.

Untold public wealth required protection from the fire demon that was daily taking its toll in spite of the valiant efforts of the small armies of fighters employed by the Federal and state governments. Here was 15 per cent of the remaining standing timber in the United States, or enough to build 43,000,000 five-room bungalows. Here was the water supply of 85 per cent of the four million acres of irrigated land in the state. In the forests was stored five million horsepower of potential hydroelectric energy. Amid the vast mountains and hills grazed 250,000 deer, 12,000 bear, 10,000 mountain sheep, some 500 antelope and 150 elk, besides a large variety of fowl and smaller game. And it was in these beautiful Federal reserves that in 1923 a total of 4,250,000 people found enchanting playgrounds.

Knowing that 80 per cent of all forest fires are started by man, the Forest Service officials first issued an order that camp-fire permits would not be given except by Forest Service officers, for any of the following National Forests: Angeles,

California, Cleveland, Eldorado, Plumas, Tahoe, Santa Barbara, Sequoia, Shasta, Sierra, and Stanislaus. The fire-emergency organization had thousands of posters printed and distributed throughout the state, warning against setting fires in forests. Prizes were offered for the best song that would put the fire-fighting idea before the public.

Instead of getting better, the fire situation grew steadily worse. For the first ten days of June there were 88 fires. One month later 216 fires occurred during a ten-day period. Conflagrations were starting at the rate of 20 a day. Paul G. Redington, District Forester of the U. S. Forest Service, broadcast an appeal to all mayors of California cities, as follows:

"California is today confronted by a most serious forest fire situation. The undersigned agencies, working in co-ordination in this matter, deem your co-operation essential and suggest that, by proclamation or otherwise, you direct the attention of the citizens of your city to the fact that care with fire in fields and forests is imperative to their own safety and welfare.

"More than 600 fires have already burned over an area aggregating 80,000 acres in this state. The cost of suppressing these was close to \$160,000. Of these fires, 403 were caused by man and were preventable. Never before in the history of the state has there been any comparable situation at this time of year, and we still have three of the worst fire months ahead of us. Every traveler to your municipal camp grounds should be instructed to be careful about fires.



A FIRE-FIGHTER'S CAFETERIA

"Come and get it," yells the cook in announcing the meal. "Plenty of bread, meat, and strong coffee, Chef, and we're good for ten hours more," reply the hungry men.

This communication was signed not only by Mr. Redington for the United States Forest Service, but by Mr. M. B. Pratt, State Forester of California, for the state; and Norman B. Sloane, for the California Development Association. It was acted upon promptly and universally by the mayors.

The Government's next move was a drastic one, but it was followed in a few days by an act that stirred the entire country. Orders were issued closing large areas to the public. Signs were posted on roads, warning people that violation of the closure act carried with it a \$500 fine and one year imprisonment in the Federal penitentiary.

approved a modification of regulations making payment of these rewards more expeditious.

Fires continued to spread and increase in number. Two hundred men fought in vain to stop a wild conflagration on Sawmill Mountain, in the Santa Barbara Forest, where 15,000 acres were burned. Rangers in charge of a small army of 500 volunteers were defeated in their efforts to stop the great Forest Hill Divide fire, in the Tahoe National Forest, when, running before a high wind, the fire broke up into three separate blazes.

On July 19, Redington called on the United States Army in the person of Col. A. V. P. Anderson, Chief



VIEW OF THE JIM CREEK FIRE, WHICH OCCURRED IN JUNE, ON THE ARAPAHOE NATIONAL FOREST, COLORADO

This fire burned over 2,500 acres in three and a half hours, before it could be stopped. The photograph shows proximity of the fire to the Moffet Tunnel camp at West Portal, where three carloads of powder were stored. Loss of this camp would have involved \$1,000,000.

Violators were arrested and held for trial. Smoking was prohibited in all forests, except at permanent camps and habitations, and permission to build camp fires was issued only to those having business in the mountains. The Federal Government offered rewards of from \$25 to \$500 for information leading to the arrest and conviction of any person setting fires or leaving fires burning in National Forests, and the Secretary of Agriculture himself

of Staff, 9th Corps Area, Presidio, San Francisco, for 250 soldiers for patrol work. Troops were mobilized; the bugle sounded among the big trees; military occupation of the National Forests for the first time in history was begun. The request for troops resulted in Army airplanes being held in readiness at the various California flying fields to fly over big fires and do reconnaissance work for the fighters on the ground.

Two detachments of an officer and eight men each, with motor transportation, were stationed at Upper Lake and at Stony Ford, in the California Forest. In the Angeles Forest four detachments of the same size were detailed to patrol the canyons most frequented by campers. Thus the troops were assigned, in one forest after another, to that territory which needed guarding the worst.

In this California forest-fire war, just as in the great war, while the soldiers at the front were fighting, the enthusiasm of the people at home was being stirred up by civic organizations. A new song came out and was rehearsed at service clubs and public meetings. It was to the tune of "It Ain't Gonna Rain No More," and ran in this vein:

A rancher had a pile of brush;
There was an awful breeze;
He touched it off to see it
burn,
And killed ten thousand
trees.

CHORUS.—Oh, it ain't gonna
rain no more, no more;
It ain't gonna rain no more;
The forest fires all burn like
h—l,
'Cause it ain't gonna rain no
more.

That Army airplanes will be flying over the menaced areas before the peak fire period is reached is the prediction made in Forest Service circles. In 1921 numerous De Havilland battle planes, speeding 10,000 feet above the ground, ticked off warnings to Forest Service stations when they spotted a fire. This service was discontinued.

Lookouts, situated at stations located on commanding peaks throughout the forests, sit all day scrutinizing the surrounding country with glasses. In the clear air, fires have been spotted more than a hundred miles away from these stations. Take the case of Benjamin Franklin Howell, an old-timer at the game, who is now a lookout at Banner Mountain Station, Tahoe National Forest. Howell sits at his desk in a house that is open on all sides, with a telephone, a map, and an instrument for measuring angles before him. As soon as he sees forest-fire smoke he sights on it with this

instrument, which gives him the location of the fire on the map. From long experience, Howell is able to tell very accurately just about in what canyon or valley a fire is burning, even though it may be fifty miles away. After locating the fire on his map, he telephones his readings to the nearest Forest office. In this office, which is equipped with the same map that Howell has, other reports are constantly coming in, and in a short time the rangers have

a reading on the fire from several points. By a technical method called triangulation, they are able to locate the fire very accurately.

The rangers telephone to the ranger who is nearest to the fire and he immediately organizes a fighting force and goes to the scene. If he has to contend with a ground fire, he stops it by digging a trench around it. If it is a raging brush fire, the fighters usually have to wait until nightfall, when the dew and absence of wind reduces the blaze somewhat, and it is much easier to stop. Because the lookout is on duty all day, giving continuous observation, while the airplane is over a given area for only a few hours at the most, the Forest Service relinquished the use of flying-machines. In the present emergency, however, airplanes may be used again to direct fire-fighting from the air and to secure a bird's-eye view of a conflagration that would require a week to reconnoiter on foot.

September is the "fire peak" month in the State of California. Authorities agree that only early and unprecedented rains can relieve the present situation or remove the danger of terrific timber loss.

Man seems powerless at times, in the face of the fires which his brothers have started and Nature in too dry a state has fed, but in the case of California it will not be lack of spirit, patriotism, or superhuman effort that lets the forest burn. The determination of the Crusaders is written on the faces of these Westerners.



A DESTROYER OF RECORD

This volcanic eruption of carelessness, on the Angeles National Forest, in California, cleaned off every vestige of growth for miles and resulted in floods of mud and rocks into the country below.

More Forests Needed for Paper

Official Reports by Governmental Agencies in Canada and the United States Stress the Urgency of Providing for America's Future Pulpwood Needs

AMERICAN paper requirements have nearly quadrupled since 1899 and now exceed 8,000,000 tons of pulp a year, according to a report on the paper and pulp situation just compiled by the Forest Service, United States Department of Agriculture, in co-operation with the American Paper and Pulp Association, and now available for distribution. It is published as Department Bulletin No. 1241, "How the United States can meet its present and future pulpwood requirements," by Earle H. Clapp, Assistant Forester, and Charles W. Boyce, Forest Examiner, Forest Service.

The per capita consumption of paper in the United States, according to the report, is double that of any other country, and the entire consumption of over 8,000,000 tons a year is greater than that of all other countries in the world combined. This means an annual use of more than 9,000,000 cords of wood, or the equivalent of the cut from some 2,000,000 acres of land. The report deals in a comprehensive manner with the country's present paper requirements, its probable future requirements, and the ways and means of meeting the demand for pulp timber, less than half of which is now being furnished by forests within the United States.

Pointing out that the regions from which pulpwood supplies are now being chiefly secured are those in which the original timber supplies are greatly reduced, the report declares that the most urgent phase of the pulp and paper problem of the immediate future is to secure annually an additional 870,000 cords of spruce, hemlock, and fir and 180,000 cords of aspen, poplar, or other hardwoods from our own forests to offset pulpwood imports. The important but less urgent phases of the problem are to increase the cut from our forests in order to protect our paper users against the eventuality of our present large pulp and paper imports, which now amount to the equivalent of 4,885,000 cords annually, being cut off.

The working out of the pulpwood problem, according to the writers, involves, first, increased production of pulp timber on the forest lands of the United States; second, the reduction of all manufacturing wastes and the development of new or modified pulping processes which will increase the number of timber species suitable for pulping and make more efficient use of all pulpwood; third, the material development of the pulp and paper industry in new regions with pulp species.

One of the tables in this illuminating report points out that the pulpwood cut annually in this country represents only 2.36 per cent of the total amount of timber harvested.

Elsewhere in the text, however, mention is made of the fact that the drain of this industry upon the timber below saw-timber size exceeds the renewal by about three times and occurs in the northeastern quarter of the United States almost entirely, for it is here that the industry is concentrated.

The possibility of establishing the industry in Alaska and the Pacific Northwest is given as one means of utilizing pulpwood now standing, but far removed from the paper-producing centers. The entire 3,916,000 cords of spruce, fir, and hemlock represented in the pulp, paper, and wood imported at present could readily be cut from these regions.

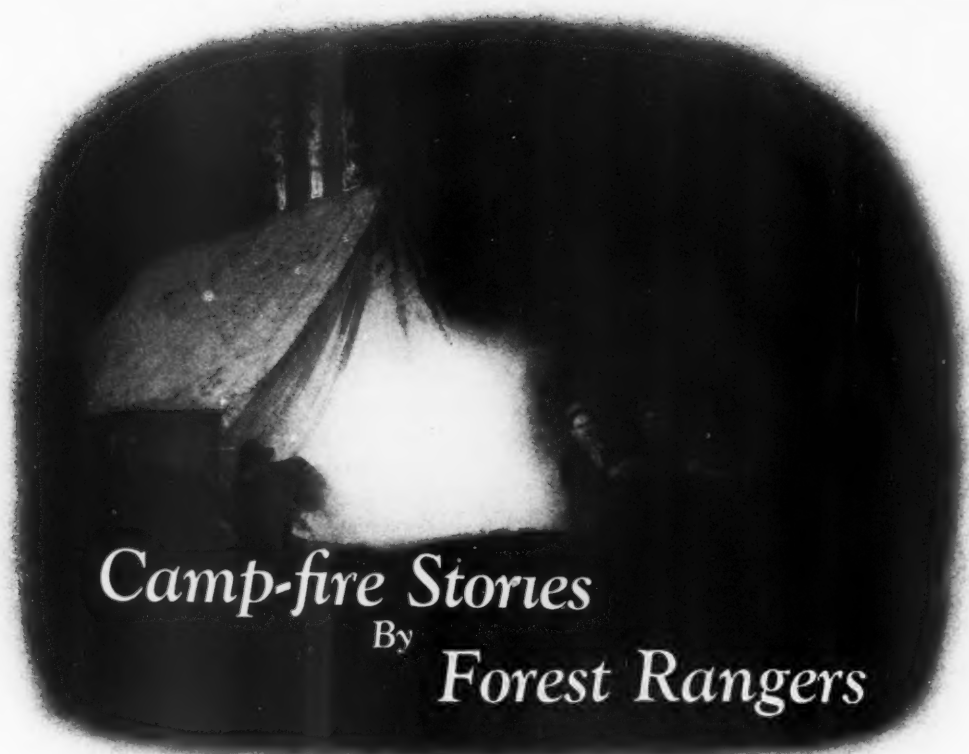
Under supplementary measures for meeting present requirements the wider utilization of sawmill waste is suggested. Unfortunately, only about one-third as much was used in 1922 as in 1909, due to the increasing distance between the pulp mills and the sources of sawmill waste. The report states that the integration of the pulp and timber industries in the United States into a system similar to the one used by the two industries in Sweden would make possible the use of 20,000,000 cords of waste annually from the species adapted to pulp manufacture. This is more than double our present total requirement.

Simultaneously with the publication of the Forest Service report comes news of the report of the Canadian Royal Commission on the pulpwood embargo. This body was appointed after the Canadian Parliament had passed an amendment to the export law, last June, which gave the Governor in Council authority to establish an embargo upon the exportation of pulpwood from Canada.

The commission includes in its report a great volume of data on the pulpwood resources of Canada, secured as the result of the testimony of hundreds of witnesses, including farmers, pulpwood dealers, and pulp and paper manufacturers from both Canada and the United States. Here it rests its case, passing back to the Canadian Government the responsibility of deciding for or against the proposed embargo.

The Financial Post, Toronto, quotes from the commission report as follows:

"So far as this commission is concerned, we have clearly pointed to the fact that some steps must most assuredly be taken whereby the annual drain on the spruce and balsam supplies of eastern Canada must be greatly reduced. In some parts this object may possibly be obtained by the complete elimination of fire and insect losses; in other cases it can only be attained by the elimination of



PSYCHOLOGY

BY HENRY L. SPENCER

Illustrated by North Stuart

"SI COLIGEY?" said the new ranger from Grass Valley, as he polished his pine-tree badge in the dim light of the camp fire. "I ain't never heard tell of him, and if this here line of talk is set and sprung for yours truly, I bite. Who is this feller, Si Coligei?"

"Son," said the old Gunnison ranger, after the uproarious laughter around the camp fire had quieted down, "you sure got a long ways to travel, and I reckon you better be movin' while it's dark, when folks what don't esteem honesty as a mark of honor can't tell green from black. Now, this here 'Si Coligei,' as you call him, ain't a 'him' at all. It's—it's a—it's just a word, the letters of which hook up thusly—P-S-Y-C-H-O-L-O-G-Y. And it's a mighty important word for a forest ranger to carry under his badge—not the word itself, but the meaning of it."

"Meaning which?" interjected the new ranger.

There was a pause and the face of the old ranger went blank.

"Shucks," he said at last; "I'm going to tell you an honest-to-goodness fire story that happened right here on the Gunnison Forest last summer—damns and hell and all—even though you ain't cut your wisdom teeth.

"Ting-a-ling-a-ling-a-ling."

The young ranger snickered.

"That's what I said—Ting-a-ling-a-ling-a-ling. That's a telephone, son.

"That darn telephone again. Answer it, Maggie," I said to the missus.

"I had rode about 40 miles that day, and it was after supper and I was some tired.

"It's a forest fire, dear," she said; 'come and talk yourself.'

"I got up kind of quick—like something was burning me—to find out about it, ogling my fire organization chart on the wall by the telephone as I talked.

"Fire at Iron Swamp, four miles west of Crested Butte," the man said. He was the road overseer, and his men had found the fire and tried to put it out, but it got away from them. I scanned down the list of co-operators on the fire chart.

"Two State Rangers at Crested," I read. They would do!

"Will you please get the State Rangers on the phone for me?" I requested the man, 'and then get two or three men and some tools and get to the fire and try to hold it until I come.' Sure he would. Well, one of the State Rangers got to the telephone pretty quick; the other one had heard of the fire and had already gone.

"Sure we'll take charge until you get there," he said,

and I could figure out that they was just rarin' to go. You see, they had been in Crested Butte a month with nothing much to do but lip cigarettes and josh counter-jumpers and telephone girls, between times watching the striking miners and making a few bootleg hauls.

"Then I throwed the harness on two of my saddle horses, hitched up to the spring buggy, put in some fire tools and my ready-packed grub box and bed, and lit out. You see, I learned through experience to always take some grub to a fire, because a man can't fight a forest fire on an empty stomach.

"I drove the thirteen miles to Iron Swamp pretty quick-like, picking up some more grub for the men in Crested Butte, which Maggie had ordered after I left.

"When I got there the State Rangers were right on the job with six men, and had the fire corralled and a good trench dug around it.

"After boiling a good pot of coffee and frying some bacon, and doing considerable talking about how the fire got set, we started a water brigade with a dozen canvas buckets and packed water all night, and by daylight the fire was pretty well drowned.

"Then to find out who started the fire!

"'Sick 'em,' the boss had said; 'when anybody starts a fire on the forest take him down and let him tell the judge about it.'

"Being a good forest ranger and the others good State Rangers, we was pretty tolerable anxious to catch the guy that started the fire.

"We didn't have much luck. It was pretty certain that the road crew had been the only ones over the road the day before, but when I stopped their truck as they come to work and questioned them, they only knew that they had found the fire when they was coming home from work. About half of them were smoking cigarettes, and they didn't look good to me, but being sort of diplomatic like, I just give them a good lecture on throwing cigarette stubs away without putting them out and let 'em go. You see, they had found the fire and tried to put it out, and then gone to Crested Butte and called me up to tell me about it. That helped some, so I didn't make any muss when they wouldn't admit starting the fire.

"Well, we packed some more water on the ashes to make sure and took the men back to town, and I paid the bills and started home.

"It was about sundown when I drove up to the gate and saw Maggie coming out to meet me.

"'There is another forest fire, and they want you on the phone,' she said.

"'Damn the fire bugs,' I growled. 'Where is it?'

"'Miss Bray will tell you,' she said, and I ran into the house to call up the supervisor's office.

"Miss Bray was the chief clerk. All the men were out on the forest. The fire was on Taylor River, twenty miles south of me, but she had already started an auto load of cow-punchers for it.

"Well, there wasn't a forest man on the job, so I called up the State Rangers, and they said they would start with a car and pick me up in thirty minutes. I refilled my grub box, got tools and bed ready to load, and was ready for them.

"'Mike,' the fat town marshal of Crested Butte, had got patriotic and come with the rangers, and 'twixt him and me and the tools and grub box in the back seat, we didn't have much room.

"'How fast can you ride, Forest Ranger?' the little ranger who was driving the Buick asked me.

"'A heap site faster'n you can drive,' I shot back at him.

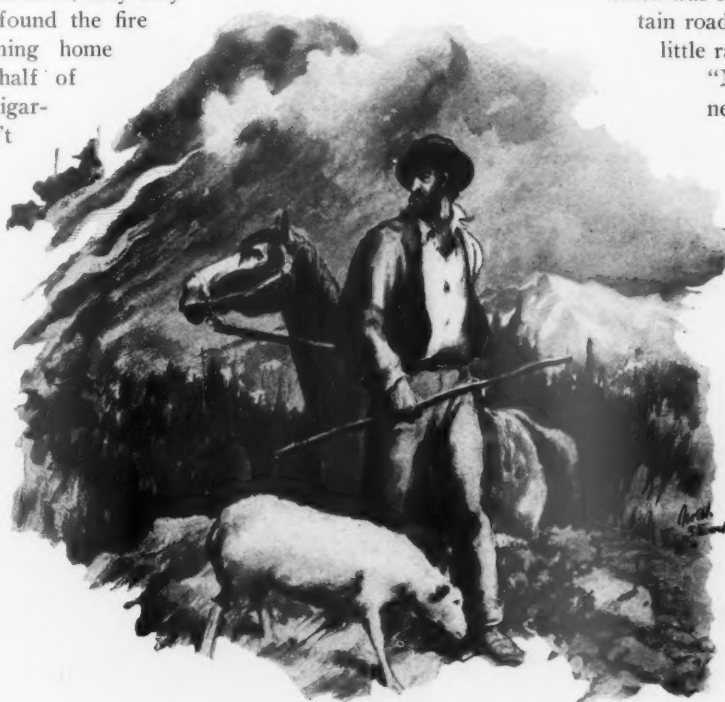
"'Well, we'll see,' he retorted, as he stepped on the accelerator and shot down the corkscrew road that went out to the main stem leading toward Taylor River.

"I thought we was going a pretty good hickory coming down Cement Creek, but when we got on the main stem, which was one of them wavy mountain roads, none too smooth, the little ranger spread himself.

"Mike commenced to get nervous, and when I leaned forward and hollered in the little man's ear, 'Is that all you can do?' Mike called me a 'damn fool' and told me to shut up.'

"I commenced to think myself that I had better shut up, when the little ranger, going about 50 miles an hour, slipped the old Buick in close to the bank and knocked fire off the rocks that was sticking out.

"It was dark when we got to



"A sheep-header started a forest fire and never tried to put it out, and I caught him. Them's the kind a ranger likes to soak"

[Cont'd on page 562]

Photographic Helps in Starting Young Forests

Photographs by Maryland
Department of Forestry



Top.—A good root system is the first essential to successful field planting of young trees, but good roots alone will not suffice. The trees must be properly planted.



Middle.—The photograph shows how young trees are to be "heeled in" in order to keep their roots from drying out between the time they are received from the nursery and the hour they are planted in the field or forest.



Bottom.—A demonstration of "puddling"—saturating the roots with wet mud preparatory to setting them in the ground.

IF YOU cannot personally witness the actual operations of planting a young forest, the next best help is to see the essential steps clearly portrayed in picture form. The series of close-up views presented on this page is designed to help those desirous of knowing just how to field-plant little trees so that greatest success may result from their endeavors.

Nature provides two seasons of the year especially adapted to field-planting of young trees—spring and fall. The spring season begins when the frost leaves the ground and ends when the new growth begins in earnest. The planting of tree seedlings in the fall should be done after summer growth has slowed down and before the ground becomes frozen. As between the two seasons, the spring is generally preferred, because the trees will begin to grow immediately and the chances for them to succeed are better. Planting in the fall, however, can be done with success, especially in those regions where the winters are not too severe and the planting site is not subject to heaving by frost.

The fall-planting season is immediately ahead, and it is time to begin to think about fall planting by selecting the trees to be planted and arranging for their delivery at the proper time. What trees to plant, in order to get the best success and at the same time have a valuable forest, is often a difficult question. It is one on which much might be written, because conditions of tree growth vary so greatly throughout the country. One of the safest rules is to plant trees that are natural to the locality, but the trouble with this rule is that there are so many trees natural to most localities that one is still at a loss as to what tree or trees shall be represented in his young forest. Most of our States now have departments of forestry, and the prospective planters of young forests should get in touch with their State foresters, who are familiar with local conditions and are in the best position to give specific advice on the selection of forest trees.

A SERIES OF PICTURES SHOWING IMPORTANT STEPS IN THE FIELD PLANTING OF YOUNG CONIFEROUS TREES

More evergreens are used for forest planting than hardwoods. The evergreens are more easily transplanted. As a rule, they grow faster, yield more timber, and present a more attractive appearance than hardwood. Softwood lumber, too, is in greater demand than hardwood, although there are a number of hardwood species, such as oak, walnut, and hickory, that bring very high prices.

What age and size of tree should be used in forest planting? Here again our advice is to consult your local forester. Because of varying conditions of soil, climate, and tree growth the answers of State foresters to this question will often vary. In general, trees 4 to 8 inches in height are planted, not only because good results are obtained from this size stock, but because work may be done at the lowest planting cost. The larger the tree planted, the greater will be the cost, and the chances are not so many of the trees will live. The great bulk of forest planting is done with trees two or three years old in the case of evergreens and one year old in the case of hardwoods. These considerations, of course, do not apply to ornamental plantings, where much larger and older trees can be successfully transplanted. Such trees can be given careful individual attention, whereas with the planting of a young forest the trees must be quickly planted, and once set out, ordinarily must shift for themselves.

The preparations for field planting should be made in advance of the receipt of trees from the nursery in order that they may be set in the ground as soon after receipt as possible. The roots of young seedlings dry out rapidly, and, even though they are packed in wet moss by the nursery, one cannot afford to lose time in setting them in the ground. If the young trees cannot be planted the same day that they are received, they should be "heeled in," which means the digging of an open trench with one side almost vertical, taking the trees in bunches from their shipping box, wetting their roots thoroughly, and, after cutting the strings which bind the bunches, placing them upright in thin layers in the trench against the vertical side. Fine soil should then be placed against the roots and firmed down with the foot. The trees are left "heeled in" until they can be moved directly to the planting site and set in the ground. If they are left "heeled in" for any length of time, care must be taken to keep their roots moist by keeping the soil in the trench well saturated with water.



Top.—The final operation is to pack the dirt firmly around the tree with the heel or toe of the shoe, so that the tree will stand upright and cannot be easily pulled out.



Middle.—Set the young tree in the hole as deep as it grew in the nursery, as shown by the collar mark on its stem. See that the roots are well spread out and then fill in with loose dirt and press down firmly with the hand.



Bottom.—A good stroke of the mattock will usually make a hole big enough for a two-year-old tree, but be sure the hole is big enough to let the roots spread out.



EDITORIAL

The Men on the Fire Line

FOREST fire news from the West tells of terrific losses and continued danger. The dryness of the country has created a serious and long-drawn-out hazard. Mills, mine and ranch equipment, homes, hotels, and other valuable properties have been destroyed. Three lives have been sacrificed, one in Idaho and two in California. There have been many injuries. Fires continue to rage. Men grit their teeth and go on with the battle. It is a man's battle. It is what Sherman said of war. There is no easy way to fight a forest fire.

We who complain of hot days in our homes, or offices, or stores, or whose work takes us into the heat of shop or field, know little of the toiling, red-eyed, choking army of forest-fire fighters who are putting in the long, desperate hours to save our woods, waters, industries, and even homes and human lives from the hand of carelessness.

Who are these fighters?

Depending on the region, they may be lumberjacks, ranchers, summer-resort employees, water-company men, road crews, section hands from the railroads, Mexican laborers, prospectors, cowboys, or, last but not least, just ordinary men from towns and cities, out on a vacation or drafted under one or another of the state laws as able-bodied.

Who leads them?

The forest ranger? In most cases, yes; but there are scarcely more than 2,500 rangers in the whole fire-stricken region, and many a hardy rancher, lean engineer, or mine or section foreman is winding up a thirty-hour shift at this minute and shouting to his weary crew to "Watch the sparks from that snag!" Nor do forest supervisors, inspectors, or state officials escape the trial by shovel and ax. Many is the grim, blackened face of a "chief" that

has lighted up as his foreman comes stumbling through the smoke to announce, "We've got 'er hooked at the ridge."

In some parts of the West fire-fighters must walk long distances, carrying heavy packs and tools, in order to get to a bad fire. Sometimes early in the night they can rest a little, making the attack at dawn with the hope of beating the late forenoon winds; more often they must start work at once, even though worn out with the day's travel. At best, if the crew reaches the fire by truck, with plenty of water, provisions, and tools, there are long, strenuous hours of quickly planned cutting of lines with the hope of starving out the oncoming flames in the case of a ground fire, or backfiring when the situation is more serious. Brush hooks and axes for cutting and shovels for clearing the ground of needles or duff—these are only useful in the hands of strong and determined men, who, when there is no crew to relieve, catch a few winks as they can and stay with the job.

Not the least difficulty is in maintaining morale. It is not easy to overcome the discouragement which follows when a fire jumps a man-made line, a stream, or other natural feature, upon which the crew has pinned its faith. Lots of bread, meat, strong coffee, and tobacco help, but it is the dogged spirit of "It's gotta be stopped" that wins.

The thanks of the American public are due the "bosses," who, thinking fast and decisively with shovels in their hands, display a remarkable generalship against this terrible invader to whom our own careless citizens betray us. Equal thanks and all honor are due the men who do the actual hard, grinding work on the fire lines. Their duty is no less imperative, their service no less patriotic, than that of the doughboy in the blazing advance on a foreign field.

Make Our Paper Industry Independent

IN JUNE, 1923, the Canadian Parliament passed an amendment to the export law which gave the Governor in Council authority to establish an embargo upon the export of pulpwood from Canada similar to those already in force in certain provinces, Quebec in particular.

The threat of this embargo and the realization that an increase in the foreign consumption of paper would create difficulties for American companies in securing imports of wood and pulp from Europe led the American paper and pulp industry to form a Committee for the Perpetu-

ation of the Pulp and Paper Industry in the United States. As a result of the request of this committee for the co-operation of the United States Forest Service, a report was issued last month which analyzes present facts concerning our pulpwood resources and possible means of making the United States independent of imports. A review of this report appears elsewhere in this issue.

The outstanding facts of this report deserve thoughtful consideration by the American public. We are the largest consumers of paper in the world, using the equivalent of more than 9,000,000 cords of pulpwood annually, of which we import a million and a half cords in the form of paper and pulp from northern Europe and 3,374,000 cords from Canada. In other words, we produce hardly half of what we consume, and we produce this in a corner of our country which is one of the most depleted of our forest regions.

What is the answer? If present sources of imports fail us or if our annual consumption of paper continues to increase, how are we to procure the raw wood needed? First, says the report, by greater production of pulpwood on American forest lands; second, by the reduction of all manufacturing wastes and the development of new and modified pulping processes to increase the number of species which can be used, and, third, by the development of the pulp and paper industry in new regions close to a supply of pulp species. Probably the most far-reaching suggestion made in the government report is that the lumber and paper industries be integrated, as they are in Sweden, so that the 20,000,000 cords of sawmill waste from species well adapted to the manufacture of pulp may be drawn upon. Only the merest start has been made in America.

One of the most immediately important factors in our paper-supply problem, however, is the possibility of a Canadian embargo upon pulpwood shipped into the United States. For some reason the Forest Service Report makes short mention and lays mild stress upon that

contingency. It is, nevertheless, a possibility that must be frankly met and wisely prepared for. True, the Canadian embargo has not yet been established as some felt it would be when the Governor in Council last spring was given authority to establish it. But the report of the Royal Commission on the Pulpwood Embargo gives no assurance that the embargo will not be established. It neither recommends for or against it, but passes the responsibility back to the Government, thus leaving the question in a state of embroiled political uncertainty. The Canadian Commission recognized that the embargo alone will not perpetuate the pulp and paper industry of Canada, but there is a strong Canadian sentiment against that country shipping pulpwood to the United States in the face of an alarming decline of the Canadian forests. The proposed embargo put into effect might conceivably over night deprive our pulp manufacturers of a million cords of wood annually. How the industry is to meet such a contingency, the Forest Service Report does not clearly state.

No one familiar with the facts can expect Canada to make our business of paper manufacture permanent. Sooner or later we shall have to depend almost exclusively upon our own forests for our paper. A Canadian embargo may disturb our paper and pulp industry temporarily, but it will not destroy it. We will find a way to make good the shortage which will be only temporary, provided we make haste in our reforestation and conservation practices.

Both reports sound a call for determined conservation practice to reduce present losses of growing pulpwood from fire, insect damage, and inefficient manufacture. Certainly the situation portrayed by the American report is one which should bring from the public a demand that pulpwood sufficient to our increasing needs be produced at home. We have the land; we have the knowledge; and the public interest is the biggest interest at stake.



Forestry and the Farmer

THE basic nature of agriculture as an industry has long been recognized by our Government. Years of sober and painstaking study have been made by the best minds of our country upon methods of increasing the productivity of our soil. Agricultural extension work has advanced to a point where the farmer need but avail himself of the wealth of advice and help. Nevertheless, the economics of this great industry seem to be in a hopeless muddle. The farmer does not get a proportionate share of return for his effort, be the cause what it may.

As the owner of one-third of our remaining forest in this country, the farmer is recognized along with the

lumberman in the recently enacted McNary-Clarke bill. He is to be given encouragement in the growing of timber as a crop. And because of the importance of his position in our Nation's forestry program, there must be absolute agreement among the agencies forwarding the practice of farm forestry. In a number of our states we have more than one state agency or institution concerned in forestry administration and education. It is the opinion of AMERICAN FORESTS AND FOREST LIFE that each state should work out now, before the new act gets under way in earnest, the agency best qualified to be the extension leader in this work. Massachusetts has already designated its state forester.

The North Woods by Canoe

[Continued from page 525]

road. Formerly Cornell University maintained an experimental Forestry Station here, but it has been abandoned. Axton is left to a few fishermen, who know the favorite haunts of the trout and bass, and to the fortunate stragglers, like ourselves, who occasionally stumble upon it.

We are not quite sure yet why Axton holds the place of honor in our memory. Perhaps it was simply the smell of the balsams, the deep calm of the forest, the beguiling confidence of the fish, or the airiness of the rooms, the general welcome of our host, and that delicious—and oh, so unexpected!—beef steak that we had for supper. But, whatever wove the charm, we are fully determined that when that mythical "some summer" comes, when we have a long vacation to spend exactly as we please, we shall hie us back to Axton and spend it all there.

Next our course took us through Spectacle Lake and, with some short carries, into Upper Saranac, through Middle Saranac into Lower Saranac,

where our trip ended. Had we had more time, we might have looped the loop by way of Big Tupper Lake, Bog River, Round and Little Tupper Lakes, back to Forked Lake, but time had a limit if the lake country had not.

We were out only three days, but we traveled 90 miles, passed through 11 lakes, several small rivers, and saw such a variety of scenery that we never tried to describe it, but left it to the more graphic camera to tell the lovely story.

But thus did we "revert to type" within less than 200 miles of the largest city in the United States, and if, as some one has said, we are a part of all that we have met, then the vigor and inspiration of the wilderness has attached itself to us and will reflect in our work and play amid scenes less peaceful and majestic.

One of the investment features of such a trip as ours lies in the pleasure of living it over again and again after it is past, recounting the many happy hours spent in the North Woods.



SMOOTH, FLOWING WATER—SO STRONG AND DEEP IT SEEMED LIKE A LITTLE ENGLISH RIVER BORDERING SOME GREAT DUCAL ESTATE

The Conflict on the Texas Plain

[Continued from page 520]

Who can foretell the outcome of the battle of the trees? Who can say that the remnants of the Atlantic forest, turning northward on the drought-guarded edge of the dry Texas plain, will not break through at some other place—some place rather less guarded—and erupt over the fertile plains of Oklahoma and Kansas and Nebraska; and, refreshed there, again push confidently after the course of empire? As long as the predatory forces of

Nature range through the forest, the trees will fall; but as long as the will to live remains, there will be trees to exert that will. Perhaps they will live. Perhaps, defeating the common enemy, they will turn on themselves, one against another, and perhaps still live.

Men have had within them that divine spark, and why not trees?

More Forests Needed for Paper

[Continued from page 535]

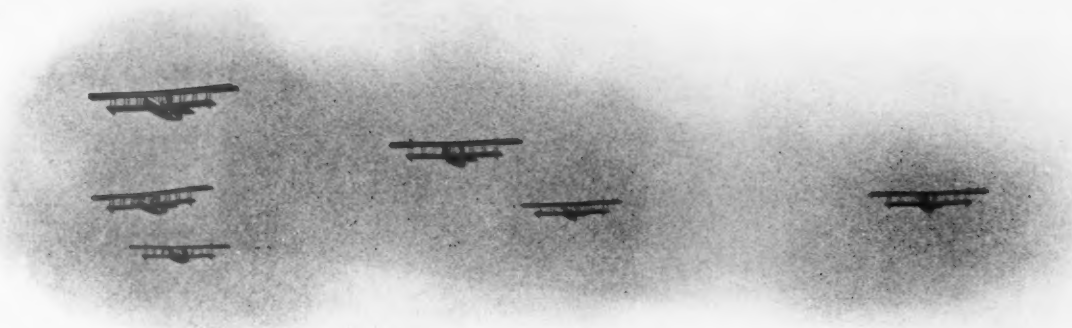
such losses plus the reduction of the amount of the spruce and balsam used, either in local industries or in export."

Much emphasis is laid on the duty of securing publicly owned forest in the provinces, even though "the position is not taken that all true forest lands should be in public ownership, for that might stifle initiative."

These two reports have a similar tone. The Canadian view with respect to Canada, although not clearly or specifically stated, seems to be that export restrictions are perhaps necessary, but that they will not take the place of urgent conservation measures in perpetuating the Canadian paper and pulp industry. The Forest Service re-

port believes that the thing of first importance is to increase the production of pulpwood on the forest lands of the United States, aiming at independence of Canadian or other imports of pulpwood, and points out that with the return of normal conditions in Europe and a consequent demand there for paper we shall not be able to secure the amounts of pulp and paper now coming from those sources. Competition in securing stocks must also be expected from the Near East, the Orient, and the Latin American countries.

Both reports are voluminous and both of them set down in a systematic manner a great body of facts which have never before been assembled.



FLYING WOOD

By WALTER M. MOORE

Photographs by Courtesy U. S. Army Air Service, McCook Field

DID IT EVER occur to you that, without the forest, man's conquest of the air might still be a blank page? If you are given to sweeping thoughts, perhaps you may have pondered upon how many pages in man's book of progress would today be blank had it not been for the forest at his good right hand. For, through the ages, wood from the forest has been the boot strap with which man has lifted himself up the ladder of knowledge.

With limbs and leaves from the trees he learned to kindle fire, and with the tough and straight-grained wood from certain species he learned to make the bow and arrow. Therewith he rescued himself from a state of savagery, by mastering the arts of supplying himself with

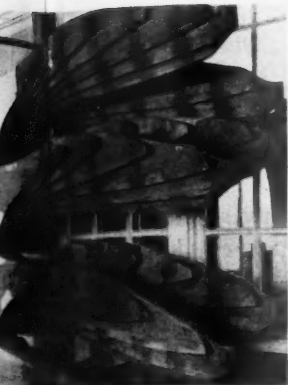
food and clothing. With easily workable wood, he stumbled upon the principle of the wheel which is basic to almost every machine or mechanical conveyance of the present age. He learned the art of plowing the soil and intensive agriculture through the happy discovery that wood could be easily fashioned into crude plows. Modern electricity sprang from Pliny's discovery that fossil resin from prehistoric coniferous forests possessed the inexplicable power of attracting straws when rubbed. Through the simple and ready adaptability of wood, man learned the art of home-building and architecture, to bridge rivers, to construct ships and master the seas, and now, within a decade, he has conquered the air by the



THE WORLD'S LARGEST AIRPLANE—THE BARLING BOMBER

Built in 1923 at Fairfield, Ohio, by the United States Army Air Service, this plane is constructed almost entirely of spruce, the number of metal parts having been kept down to a minimum. It is 120 feet broad from wing-tip to wing-tip, 65 feet long, 26 feet high, and weighs, fully loaded, 40,000 pounds. It is propelled by six Liberty engines.

Conquest of the Wood has Played Vital Part



construction—Propellers as they
the clamps. The wooden "lamina-
e been glad under heavy pressure
and await final carving

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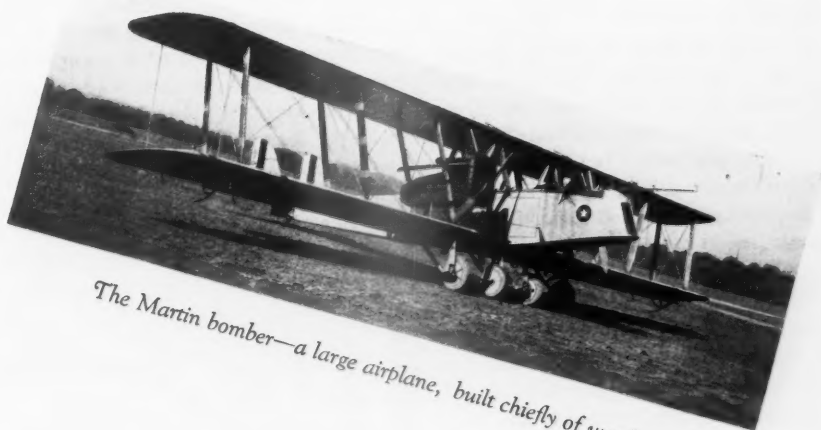
that climbs into the tree tops, and
res watches the birds flying easily from
has man, for many centuries, looked
d friends and wondered why he could
ey do. Mere wondering never took a
e; but empty wishes were finally
real effort and effort was rewarded with

perpetual motion, was considered im-
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ding the possibility of flying, there
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to make careful study of the problem
t. They were soon at work on a "flying



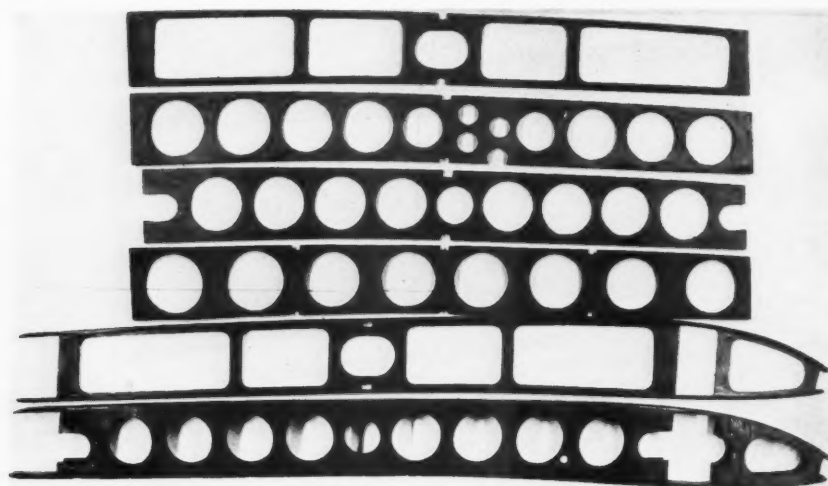
The famous T-2, in which the non-stop flight from the Atlantic to the
Pacific was made by Lieutenants Macready and Kelly.
The wings are built of wood



The Martin bomber—a large airplane, built chiefly of wood



The well-known Curtiss airplane; also built chiefly of wood



WING-WEBS

The "cut-outs" are made for the purpose of reducing the weight. The web at the foot of the picture is a hollow "box," constructed of two webs with a cap-strip glued to the top and another cap-strip glued to the base. Such box-webs, though very light in weight, are of remarkable strength and rigidity.

machine." After many failures, the first flight in a power-propelled airplane was made by the Wright Brothers at Kitty Hawk, North Carolina, on December 17, 1903. Several flights were made on that day. The longest flight lasted 59 seconds, and its speed was at the rate of 30 miles per hour. In the twenty years that have elapsed since then, we have made such progress in aerial flight that airplanes have remained in the air for over 36 hours, and a speed of 266 miles per hour has been attained.

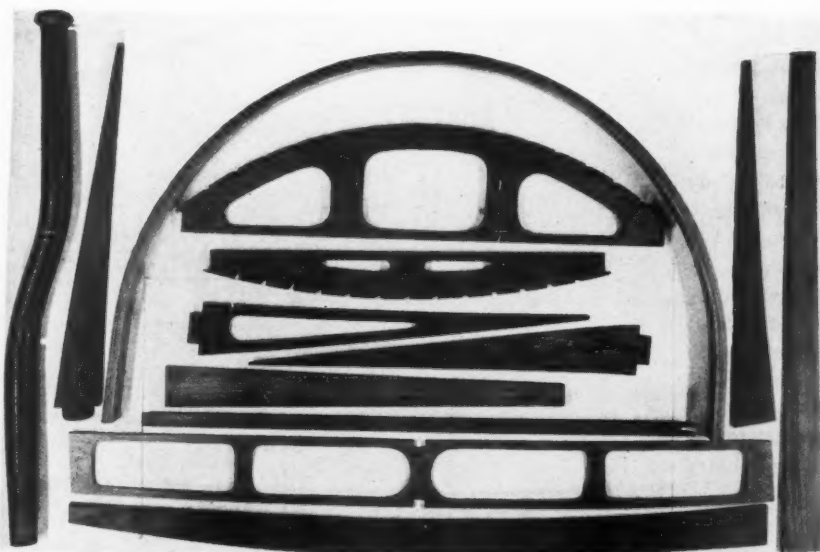
Careful observation of the flight of birds has been of great assistance to designers of airplanes; and yet, after all, it has not been possible to reproduce, by mechanical methods, the wing motion of a bird. This has been tried many times. Airplanes with flapping wings, or ornithopters—we might almost call them flappers—have been constructed experimentally, although little success has attended the painstaking work of the men who have built them. The airplane designer cannot use the bird as his model. However, the general shape and curvature of a bird's wings and the lightness of a bird's skeleton have been copied by airplane designers, and wood has proven especially adaptable for building a vehicle capable of flight.

For several years nearly all types of airplanes were built al-

most entirely of wood. More recently metal has been substituted, particularly for the framework of the "fuselage" or body of the airplane, for the undercarriage, and for the struts that connect the upper and lower wings. The metals used, chiefly in the form of tubing, are steel and duralumin, an alloy of steel and aluminum. Although the airplane body may be built out of metal, the wings are constructed of wood in almost all the newer types and many designers and manufacturers still use wood everywhere in preference to metal. The world's largest airplane, the Barling bomber, which was assembled at Fairfield, Ohio, in 1923, is built altogether of spruce. The Barling bomber is

120 feet broad from wing-tip to wing-tip. It is driven by six Liberty engines and carries 2,200 gallons of gasoline. It can carry a load of 10,000 pounds of passengers or freight. The smallest airplanes ever built are also made of wood.

Of the woods employed in airplane construction, spruce is the most widely used, because of its long, tough fibers, its straight grain, its good machining qualities, and its lightness. The next most valuable airplane wood is ash, which is preferred by some designers for



WOOD PARTS FOR AIRPLANES

On the extreme left is a control stick, made of second-growth hickory glued together. The semicircular piece, looking like half a barrel hoop, is a "cowl former" for supporting the curved cowling on top of the plane. It is made of white ash, steamed and bent. The large wooden piece just below is one of the supports for the "turtleback" or rear fuselage cover; it is made of sugar pine. The four pieces below are also sugar pine. The narrow strip below them, notched at one end, is of yellow poplar. Below this is a wing-web, with four rectangular openings; it is made of birch veneer. Below it is a "solid" web, made of sugar pine.

the parts that are likely to receive the severest shocks.

These two species—spruce and ash—are the premier woods for airplane construction. Several other coniferous woods have occasionally been substituted for spruce. Oak

and hickory are often used in place of ash. For propellers, white oak, black walnut, yellow birch, mahogany, black cherry, and yellow poplar are

used; nine-tenths of all propellers that have been manufactured have been made of oak, walnut, or birch.

Plywood, from 1/16 up to 1 inch thick, made up of from 3 to 17 plies, the outside plies being birch or some other hard wood, is also used in airplane construction. Built-up wood is more nearly homogeneous than single boards. Thin plywood is useful for the curved outer surfaces on the leading edges of wings and on the top of the fuselage. Thick plywood, which cannot be bent, is very strong and rigid, and is used for the cross-members supporting the aviation engine, for the seats for pilot and passengers, for the "bulkheads" or transverse members, for control sticks, and for instrument boards.

A finished part for an airplane—such as a seat rail, horizontal strut, tail-skid, wing-beam, or any other part made of wood—must be made from the best and strongest material that can be obtained. Owing to the form and structure of a tree with branches that cause knots in the trunk, and because of injuries from wind, fire, insects, and fungi, it is impossible to obtain long timbers, of large cross-section, absolutely free from defects. Therefore it is not required that spruce timbers be absolutely perfect material, but it is required that a carload of airplane lumber be reasonably straight-grained, sound, sawed to dimensions, and selected from the highest grades of lumber. From it are sawn clear pieces in such sizes as may be required for manufacture into airplane parts. All pieces showing decay, knots, excessive spiral or diagonal grain, large wormholes, or other defects are rejected.

Green lumber is never suitable for airplane work, for it shrinks as it dries out, and unless dried under proper conditions of humidity and temperature it warps, twists, and splits. Even if lumber has been air-seasoned for a long time, it is necessary to dry it in a kiln until it is sufficiently dry so that it can be planed smooth.

The body, or fuselage, of an airplane is a long structure having a rectangular cross-section. The main members are the four "longerons," one at each corner, extending the entire length of the fuselage. The longerons are usually of ash; if a length greater than 12 feet is required, two or more are spliced.

Connecting the longerons at regular intervals are the

"fuselage struts," which as a rule are made of spruce. These struts serve to hold the longerons apart at the proper distance and give rigidity to the entire frame. Struts and longerons are joined by specially designed

steel "fittings" and the framework is further strengthened by diagonal brace wires. These wires are of just the same material as the larger music wires on a piano,



AN EXPERIMENTAL RIB

and their tension is regulated by turnbuckles. The fuselage frame is covered with cotton or linen cloth, this cloth being protected by several coats of "acetate dope," a cellulose compound which makes the cloth as smooth and tight as a drumhead, keeping out the wind and moisture. In some types of airplanes plywood is used instead of cloth for the outer covering, the plywood adding considerably to the strength and stiffness of the frame.

The upright pieces between the upper and lower wings are known as "interplane struts," and the V-shaped pieces, under the fuselage and just above the axle connecting the wheels, are known as "landing gear struts." These struts are usually solid spruce timbers.

The wing framework is made up of two main "wing-beams," to which are joined the wing-webs and ribs. The wing-beams are, in some cases, solid timbers; in the larger wings, they are often built up in the form of a hollow square. The numerous webs, braces, cap-strips, etc., are made as light as possible in order to keep down the weight of the finished wing. Some of the webs, viewed by themselves, appear so fragile that one might doubt that they could serve a useful purpose.

For an airplane that travels slowly—50 to 75 miles an hour—a cloth covering on the wing is all right; but for one that travels 100 to 150 miles an hour the cloth tends to bulge out or to blow in, thus increasing the wind resistance and decreasing the lifting capacity. In the racing airplanes, in which speeds over 260 miles per hour have been obtained, it is exceedingly important that the proper streamline curvature of all surfaces be undisturbed. In order to reinforce the forward or "entering" edge of the wings, against which the wind strikes with force, it was found necessary to place a strip of plywood under the fabric, bent to the desired curvature. It was also found necessary to double the number of webs in the wing so as to provide more points of contact between the cloth fabric and the wood frame, for the fabric is attached (by means of stout cord) to the wing framework at every available place. Still more recently it has been found advisable to cover the entire wing with a thin sheet of plywood, providing a rigid surface. This is more expensive than a cloth cover, but it makes the best wing that has yet

[Continued on page 559]

FLOWERS OF THE HIGH PLACES

More Striking Examples of Alpine Flora Which Flash Their Summer Colors on the Rugged Shoulders of Our Western Mountains

Part II

BY WILLIAM ADAMS DAYTON



FIG. 12—SAXIFRAGA BRONCHIALIS

WHAT group of plants is more typical of spring than the Saxifrages, the "stone-breakers," as their name literally signifies? Some of the smaller, often mosslike, members of this family are at home only in "the hielands." "Amang the train," ensconced in some rocky cleft, one often sees the dainty Arctic Saxifrage (*Saxifraga bronchialis*), shown in Fig. 12.

The Roses, generically, are hardly representative of heights where brumal blasts hold sway, yet a considerable number of their family are met with there. The mostly 8-petaled Alpine Dryad, or "White Mountain Avens" (*Dryas octopetala*), is found in alpine and arctic North America, Asia, and Europe. It is really a diminutive shrub and is a plant of remarkable elegance of form and color (Fig. 13). *Luetkea* (*Luetkea pectinata*), a tiny little rosaceous undershrub (Fig. 14), commemorates a distinguished Russian nobleman and navigator, Graf Fedor Petrovich Lütke (1797-1882), who published an account of his extensive voyages and explorations in the 1830's. This floral namesake is an odd, but attractive, denizen of the peaks. *Petrophyton caespitosum* (Fig. 15) is another curious, often subalpine, or alpine undershrub, whose dense white floral spikes are very distinctive; the writer knows of no English name for it. Several other rosaceous genera are met with in the high mountains of the West, notably Strawberry (*Fragaria*), Avens (*Geum*) and Cinquefoil (*Potentilla*).

The "heathers" (*Ericaceæ*) are characteristic of acid ("sour") soils (or, as the high-brows say, "those with a hydrogen-ion content"), which, at alpine elevations in the western mountains, often include thin films of new soil over granite and basalt. In such sites no plants are commoner than the Mountain Heaths of the genera

Cassiope and *Phyllodoce*, whose white and red, bell-like blossoms are loved by the alpine climber and by the ptarmigan as well—but for gustatory reasons. A photograph of a patch of the "Red Heather," or False Crowberry (*Phyllodoce empetriformis*), blossoming near banks of snow on the rock-ribbed flanks of some high peak of the Deschutes Forest, in Oregon, is shown in Fig. 16.

Primroses, too, must be included in the category of alpine-dwellers. Fig. 17 shows the lovely purple-flowered Parry's Primrose (*Primula parryi*), drawn from a specimen collected at 13,000 feet, near perpetual snow, in moist coarse gravel, on the Uncompahgre National Forest, Colorado. Starch-leaved Primrose (*Primula farinosa*), its lower leaf-surfaces mealy with a white, starchy ("farinose") covering, is a smaller and more strictly alpine species and is found in the Old World as well.

A homely wiry little plant, allied to the primroses, is shown in Fig. 18, *Androsace puberulenta*, for which the writer knows no English equivalent save the Græco-Roman name *Androsace*. This genus is characteristic of high mountains, both here and abroad.



FIG. 14—LUETKEA PECTINATA

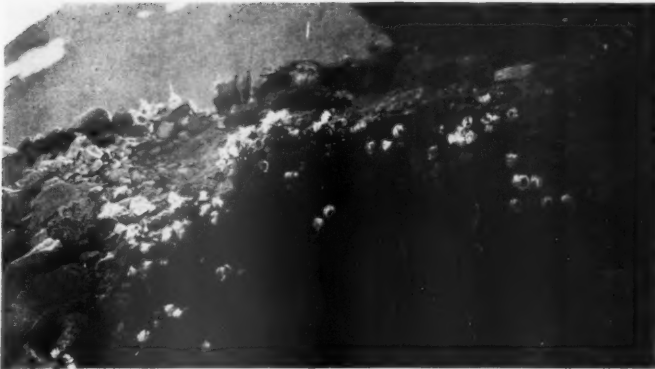


FIG. 13—DRYAS OCTOPETALA



FIG. 15—PETROPHYTON CÆSPITOSUM

When Bryant wrote his poem on the "Fringed Gentian," it is said that a sort of gentian cult arose that bid fair for a while to exterminate the flower. Many singers have sung the praises of the rich sapphirine depths of gentian blues, and Francis William Bourdillon, with poetic "abandon," avers that



F. B. Lenzie

FIG. 16—"RED HEATHER" (PHYLLODOCE EMPETRIFORMIS)

"Ages ere man arose to mark the hours,
The dawn descending kissed awake blue stars
Of gentians, and all tender alpine flowers."

The Western Fringed Gentian (*Gentiana elegans*), dear to western mountain-lovers, is well shown in a photograph (Fig. 19) taken on the San Isabel Forest, Colorado. To the left of the clump of fringed gentians will be seen a solitary stalk of one of the small-flowered annual gentians known as "amarellas"—very possibly *Gentiana strictiflora*. A more wholly alpine gentian is shown in the next picture (Fig. 20), a yellow, green, and purple species,

Alpine or Romanzof's Gentian (*G. romanovii*), also on the Colorado National Forest. This plant commemorates a very gallant Russian nautical gentleman and intrepid explorer, Romanzof, after whom a range of mountains in northern Alaska is named.

What plants are more typical of our high western mountains than the Phloxes and Polemoniums? These are very well known and easily identified by their pictures herewith.

The Forget-me-nots (*Eritrichium* and *Myosotis* spp.) bring joy to all, as



FIG. 17—PRIMULA PARRYI

well as the merely sentimental, and they are typical mountaineers. Fig. 23 shows one of these plants (*E. elongatum*) on the Washakie Forest, half hidden among tufts of grass and the buttercup-like *Sieversia turbinata*. But perhaps the golden apple for beauty prize among the Borages (*Boraginaceæ*) must go to the "Bluebells" (*Mertensia* spp.), prized by esthete and sheepman alike; none can escape the charm of their heavenly blue blossoms and their at-

mosphere of floral aristocracy. The grace of one of these Bluebells (*Mertensia pulchella*) is admirably shown in Fig. 24, taken on the Umatilla Forest, in Oregon.

The Figwort-Snapdragon group (*Scrophulariaceæ*) presents several additions to our alpine bouquet. One of the pale-flowered and bracted species of Paintbrush or Painted-cup (*Castilleja*), framed in a setting of asters and arnica, is shown in a photograph made on the Colorado Forest (Fig. 25). "From Greenland's icy mountains" came the original Elephant-weed, Elephant's-head, or Greenland Louisewort (*Pedicularis granlandica*=*Elephantella granlandica*) (see Fig. 26), whose dark,

fern-like foliage and rose-pink corollas, reminiscent of diminutive elephant's heads, have cheered many a footsore pilgrim in his climbings to some æry summit.

Dr. Arthur W. Sampson, now an Associate Professor in the University of California and the first Director of the only Forest Service Grazing Experiment Station (the Great Basin Experiment Station, Ephraim, Utah), made the fine photograph of Blue Beardtongue (*Pentstemon glaucus*), taken up near perpetual snow, on the Wallowa Forest, northeastern Oregon. "Orpheus could lead the savage race, and trees uprooted left their place sequacious of his lyre," says Dryden, and we would like to think that the inquisitive fly that has obtruded himself into Fig. 27 was likewise smitten by the persuasive charms of beauty; but it may have been mere immoderate conceit which constrained him to "register" in the picture.

And now we're at the end, the evolutionary apex of



FIG. 18—ANDROSACE PUBERULENTA



A. H. Carhart

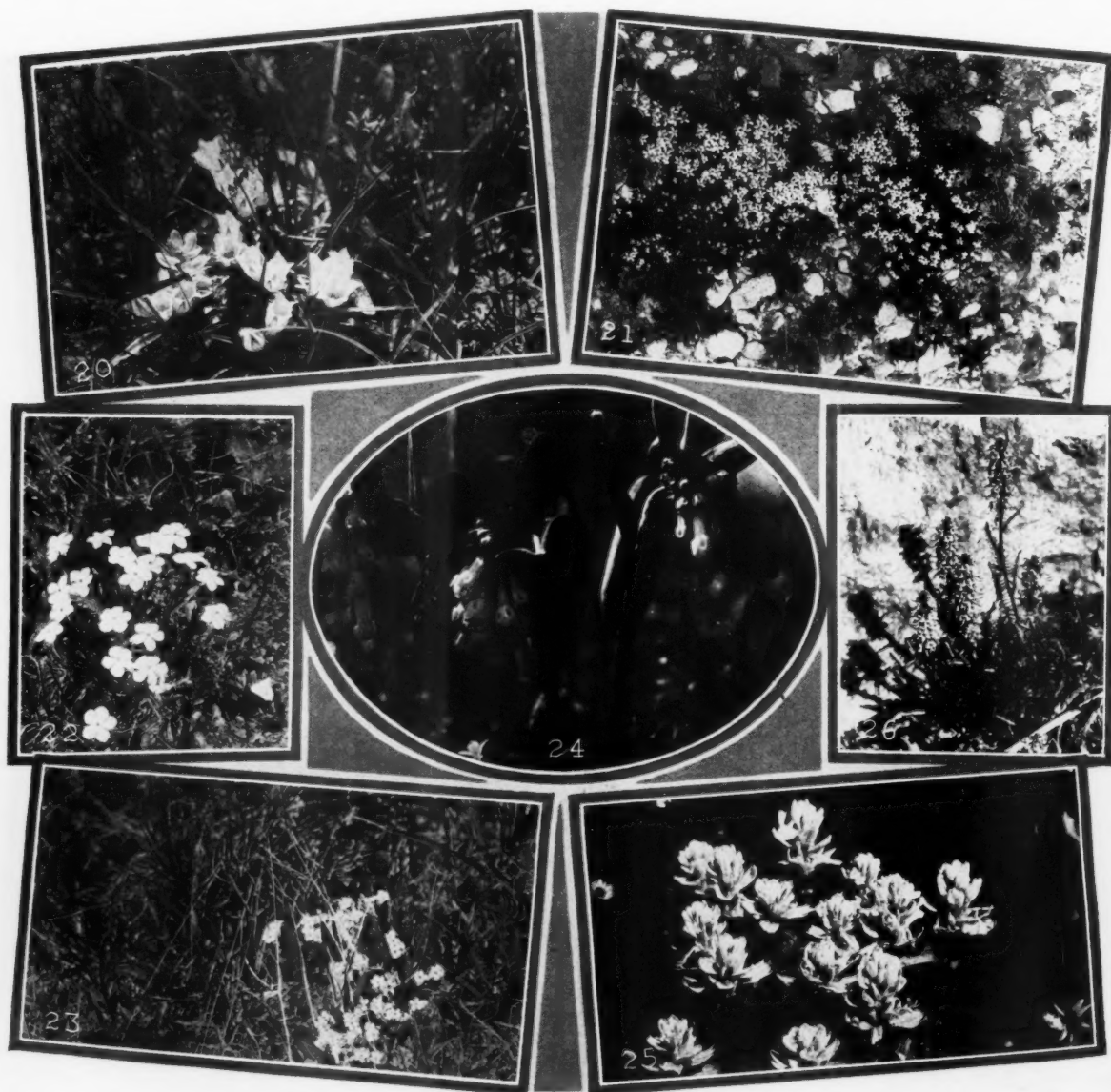
FIG. 19—FRINGED GENTIAN (GENTIANA ELEGANS)

the vegetable kingdom, the Composites. These, as might be anticipated, are much in evidence in the forbidding conditions of arctic-alpine cold; but we have time merely to mention a few of them. The Yarrows are so well known that we will but name them. Fig. 28 gives a very good idea of the showy, yellow-blossomed, broad-leaved Arnica (*A. latifolia*), a distinctively high-montane species. This is, of course, a congener of the European alpine Arnica (*Arnica montana*).

The writer will never forget the impression made when, one day in late July, he got his first glimpse of Alpine Hulsea (*Hulsea nana*), (see Fig. 29), flecking, as if with golden double-eagles, the gaunt apex of Eagle Cap, the highest mountain in eastern Oregon. This

genus was named for Dr. G. W. Hulse, of Louisiana, for many years a surgeon in the U. S. Army and, as Dr. Gray called him, "a zealous cultivator of botany." *Hulsea* is a small group of composites characteristic of high peaks, near the line of perpetual snow, in the Northwest and the Pacific States. The big yellow flower-heads, pinnatifid and often densely woolly leaves, set off by a background of volcanic scoria, form a memorable picture in the mind's eye of many a "Mazama" and other climber of the western heights.

No living American botanist is better known than Dr. Per Axel Rydberg, a curator of the New York Botanical Garden, and whose Floras of Montana, Colorado, and of the Rocky Mountains and Adjacent Plains, as well



A GROUP OF LOVELY ALPINE FLOWERS

Fig. 20—Alpine or Romanzof's Gentian (*G. romanzovii*); Fig. 21—Blue Alpine Phlox (*Phlox caespitosa*); Fig. 22—Hood Phlox (*P. hoodii*); Fig. 23—Forget-me-not (*Eritrichium elongatum*); Fig. 24—"Bluebells" (*Mertensia pulchella*); Fig. 25—Paintbrush or Painted-cup (*Castilleja*); Fig. 26—Elephant's head (*Pedicularis grænlandica*—*Elephantella grænlandica*).



FIG. 27—BLUE BEARDTONGUE (PENTSTEMON GLAUCUS)

Arthur W. Sampson

as other contributions to botanical science, are indispensable to the student of west American plants. Perpetuating Dr. Rydberg's name is the genus *Rydbergia* (Fig. 30), a group of two Rocky Mountain species occurring in the high mountains, usually on alpine peaks. Rydbergias are small woolly perennials, from taproots, with alternate pinnatifid leaves and exceptionally large yellow flower-heads. It may be of interest to note in this connection that a close ally of *Rydbergia* is the ill-omened Pingue, or Rubberweed (*Actinea richardsonii* = *Hymenoxys floribunda*), a plant with a bad reputation for poisoning sheep in Colorado and the Southwest and from whose latex abortive attempts have been made to distill commercial rubber.

Before dismissing the Figworts finally a word or two about the Pentstemons, Beardtongues, or False Foxgloves (*Pentstemon* spp.), than which no genus of plants is more distinctively American

and west American, would not be amiss. What, for instance, could be more charming than the carpet of Cliff Pentstemon (*P. rupicola*) nestling against the naked rock shown in Fig. 31, an excellent photograph, taken on the Santiam Forest.

Townsendia is a genus of low, aster-like herbs of the Rocky Mountains. The name commemorates David Townsend, of West Chester, Pennsylvania, an associate of the better-known Pennsylvania physician-botanist, Dr. William Darlington (after whom the

California Pitcher-plant, *Darlingtonia*, is named), and the author of "*Flora Cestricea*" (published in the early 19th century).

The photograph taken on the Colorado National Forest (Fig. 32) is an exceptionally good representation of the alpine Stemless *Townsendia* (*T. exscapa*) in full bloom. The petal-like ray-flowers

are usually bright white, but sometimes pink purple.

Thus ends an incomplete "round-up" for an alpine nose-gay. When the great buffoon, Falstaff, "cashed in," we read "a babbled o' green fields," and one wonders whether the Delectable Mountains, whose vision so fascinated Christian at the end of his memorable journey, beckoned to him with alpine mead of Paradisian asphodels. It must have



FIG. 28—ARNICA LATIFOLIA



FIG. 29—HULSEA NANA



FIG. 30—RYDBERGIA GRANDIFLORA



D. C. Ingram

FIG. 31—CLIFF PENTSTEMON (P. RUPICOLA)

[Continued on page 564]



The Man Who Started Forest Protection Week

BY JOHN D. GUTHRIE

WHO started Forest Protection Week—a period now set aside every year by Presidential proclamation, during which the American people are fired to an appreciation of the menace of forest fire? From coast to coast, Forest Protection Week has within less than half a decade become a national custom. President Harding first honored it by a special proclamation in 1922, and again in 1923, and President Coolidge in 1924 continued the Presidential custom. From a small beginning in the Pacific Northwest in 1920 the idea rapidly spread over the country until it is now nation wide. In 1924 the governors of nineteen states regarded it so important that they issued separate proclamations, while other governors sent out special messages to their people. The idea has broken over our national boundaries and taken root in British Columbia, which this year celebrated her first Forest Protection Week.

Whence came the idea? Out on the West Coast there lives a man who has a creed as big as the traditional West itself. This creed is that scenery created by God or man out of our own good rich soil is an asset worth more than dollars and cents. His

name is Herbert Evison, and he is secretary of the Washington Natural Parks Association. So thoroughly does he believe in saving well-distributed scenic spots that in his own State of Washington he has succeeded in getting hard headed business men to spend money to do it. Evison started a system of parks and camping grounds where motor tourists might pause and enjoy the scenic splendor of the evergreen State of Washington. Money Creek Park, 60 miles east from Seattle on the Stevens Pass Highway, is a model of beauty, restfulness, and convenience. It was purchased by the Washington Natural Parks Association and will eventually be turned over to the state.



HERBERT EVISON—PRACTICAL EXPONENT OF FOREST FIRE PROTECTION

The Ranger Kiddie Contest



Montana Pals

In Which the Prize Winners and Runners-up in Our Contest for Pictures of Little Ranger Folks Are Introduced to the American Public



"Raised" in Idaho

WHEN the idea of a Ranger Kiddie Contest came to life, there was a firm conviction that the children of these modern pioneers, who go by the name of forest rangers, could furnish a big measure of joy and inspiration to the readers of AMERICAN FORESTS AND FOREST LIFE. Now we know it more than ever. But after hours and hours of comparing, commenting, arguing, laughing, and judges in this contest were about two hundred and six. The judges sider three things awards: First, the and beauty of the dent in the picture setting of the pic ing the flavor of door life, and, ficial excellence self. This seemed a the awards. One is vigor, Americanism, ture which was submit to be congratulated up conservationists, with a born in them. On ac there were almost as many group pictures as there were individuals, it was decided to make two sets of awards, one for individuals and one for groups.

The group of three boys with their baby sister draws first prize for the best group. Ranging in size they are, largest boy, Forace G. Green, 11; next, Dauchy E.,



More from Montana

8; next, Doyle T., 5, and the baby girl is Virgie K., 4 months. These are the children of Ranger and Mrs. George A. Green, of Sandy, Utah. Mr. Green is a Ranger on the Wasatch National Forest.

Coles Russell, age 6, who handles the rope, and Edmund Russell, age 3, take second prize in the groups. These boys were born in the Big Bend Grande River, in Texas, Ranger and Mrs. Lincoln National ico. Barbara and daughters of L. R. De Camp, California, take groups. Their er on the Tahoe California. First viduals goes to Laybourn, the gun- tana, 16 months old was taken. He is the W. M. Laybourn, now Oreille National Forest, Jr., 13 months, discover Gaffey Ranger Station, Forest, New Mexico. His parents are Mr. and Mrs. Fred Merkle, now stationed at Flagstaff, Arizona.



Four of a Kind in California

Vera Thompson, daughter of Ranger and Mrs. Thomas Thompson, Marblemount, Washington, comes third in the race. Mr. Thompson is Ranger on the Washington National Forest.



Alaska Water Baby



Jimmy and Rags from Arizona



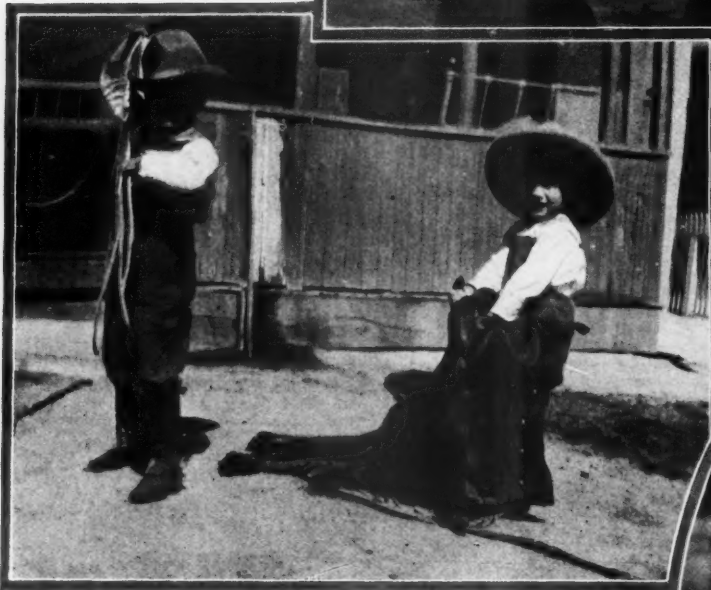
Down in New Mexico

Pictures of Prize Winners Are Shown on Pages 554 and 555 Following

FOREST PEOPLE OF TOMORROW

Group Prize Winners

First Prize—The Green boys and their sister, from the Wasatch in Utah. From the largest down they are, Forace G., 11; Dauchy E., 8; Doyle T., 5; and Virgie K., 4 months.



The original of this picture of the children of Ranger and Mrs. George A. Green, Jr., says, "Just as they were."

Second Prize—These Arizona Buckaroos are Coles Russell, 6, and his brother Edmund, 3. They are the sons of Ranger and Mrs. George D. Russell, of the Lincoln National Forest, in New Mexico.

Third Prize—The wrecking crew to the right, Barbara and Betty De Camp, who know the joy of winter sports at Truckee, California, where their parents, Ranger and Mrs. L. R. De Camp, live on the Tahoe National Forest.



Individual Prize Winners Ranger Kiddie Contest

First Prize—Myron Donald Laybourn (right), age 16 months. A Montana gunman who has now moved to Naples, Idaho, on the Pend Oreille National Forest. Son of Ranger and Mrs. W. M. Laybourn. He is bigger now, knows the trees and is a crack rifle shot. Born at the station shown in the picture.



Second Prize.—Fred Merkle, Jr., age 13 months, an Arizona logger. Born at McGaffey Ranger Station, on the Cocino National Forest, now living at Flagstaff. His mother and daddy are Mr. and Mrs. Fred Merkle. The young man shows signs of becoming an entomologist.

Third Prize.—Vera Thompson and her playmate, who wasn't one of the judges. This little girl is the daughter of Ranger and Mrs. Thomas Thompson, of Marblemount, Washington—Washington National Forest.



These Gave the Prize Winners a Close Race



1. Children of Ranger and Mrs. J. A. Frieborn, Arizona, "When the Rains Came." 2. This pair from Arizona belongs to Ranger and Mrs. Tracy W. Rice. 3. Thomas F. Hale, a gentleman from Arkansas. 4. Russell, of New Mexico, "Gee, Nobody loves a fat man." 5. Betty Cleator from Oregon, a member of Robin Hood's band. 6. Healthy members of the family of Ranger and Mrs. John S. Brender, of Washington. 7. Sonoma Robins, of Utah, four years old and rides alone. 8. Two adventurers from the family of Ranger and Mrs. Ray Pack, of Colorado.

Pine Pure or Pine in Mixture

A Plea to Those Who Would Grow White Pine Forests to Copy Nature and to Beware of Breaking Her Laws

BY A. C. CLINE

THOUSANDS of acres of pure white pine have been planted in the East and thousands more are being planted. Because white pine is the best eastern conifer, almost everyone says:

"Let us have lots of it; let us plant it anywhere we can find room—in pure stands. The more, the better!"

But white pine never grew "naturally" in pure stands, except on sandy soil, and it seems quite certain that it was never intended to be grown that way.

Human attempts to improve upon Nature by favoring

growth is practically at a standstill. And yet the planting of pure pine goes on, and more and more time and money have to be charged against the white-pine weevil, the Pales weevil, the white-pine blister rust, heart rots, and other "ailments." Even were it economically possible to eradicate all of these enemies, the fact would still remain that pure, even-aged stands of white pine, on the heavy soils, do not come up to our expectations. Owing to the uniform height of the trees, crown friction often starts to develop when the stand is not over fifty years



WHAT OFTEN HAPPENS IN A PURE, EVEN-AGED WHITE-PINE STAND

The camera which snapped this picture was pointed upwards into the crowns of the trees. Note how friction has worn the crowns down to mere wisps. The crooked stems are caused by the white-pine weevil. These trees are less than seventy years old, yet they have been in a stagnant condition for at least a decade.

one plant or animal at the expense of another have often resulted in destroying the fine, natural balance of things, in increasing the destructiveness of diseases and pests of one kind or another, and in producing conditions which were not anticipated. While the planters are busily engaged setting out the open fields and cut-over lands with white pine in regular rows six feet apart, millions of insects are sharpening their "teeth" and making ready to attack the unsuspecting seedlings; billions of fungal spores are being made ready for dispersion at the proper time; and, worse yet, many stands of pure pine still in early middle life are not even "earning their salt," because their

old, and gradually so reduces the size of the crowns that growth is practically nil. Furthermore, the lack of a mixture of hardwoods and heavy-foliaged softwoods, such as hemlock, certainly reacts unfavorably upon the productivity of the soil, as well as upon the quality of the pine.

In contrast to the general unhealthiness and poor quality of white pine grown in pure stands is its health and high quality when grown in proper mixtures. In the old-growth forest on rich soil white pine grew singly or in small groups in mixture with numerous other species, both hardwoods and softwoods. Its early struggle with

its neighbors served to prune it of its dead branches, thus improving its quality, while the whole rank and file of mixed growth insured its long, healthy life and final dominance in the stand. When once it had overtopped its associates, its crown expanded, its growth was accelerated, layer upon layer of clear wood was laid on, and it retained its health and vigor for a century or two.

But it is not necessary to allow white pine to grow for two or three centuries in a mixed stand in order to secure many of the advantages of the mixture. Recent studies made at the Harvard Forest have shown that natural forces may be so directed and speeded up by silvicultural treatments as to justify the growth of pine in mixed stands on rotations of well under one hundred years, and such mixtures give promise at least of alleviating many of the "ailments" of the pure pine stand, as well as affording the distinct advantage of not having "all the eggs in one basket." Furthermore, pine-hardwood mixtures lend themselves to a lengthening of the rotation, without danger of stagnation, thus making possible the production of large, high quality timber.



A REMNANT OF OLD-GROWTH MIXED FOREST

White pine, on the heavy soils, grows "naturally" as single trees or in small groups within mixed woods composed of a great variety of species, both hardwoods and softwoods.

Admittedly, there are good arguments in favor of planting pure white pine in the case of private industries which are almost wholly dependent upon it. On the other hand, it is highly desirable in the case of public forests, where due regard should be had for stability,



WHAT HAPPENS IN A MIXED STAND

Note the clear, straight stem of a pine which has grown up with hardwoods. This pine has outgrown all of its neighbors, and, with its crown completely exposed to the elements, it will remain healthy and vigorous for a century or more, putting on layer upon layer of clear wood of highest quality.

permanency, and a safe public investment, to favor the establishment of stands which are well adapted to the environment—stands which will remain healthy and productive over long periods. Moreover, if the public does not take up the production of high quality, large dimension white pine, such as can be grown only in mixtures, it is doubtful if we shall ever have any.

By far the safest and surest motto for one to follow is—"Copy Nature and hasten her work," and any program of forest establishment which is not in accordance with Nature's laws is bound, in the long run, to fail.

Recreation Conference Proceedings Published

THE COMPLETE proceedings of the National Conference on Outdoor Recreation, held in Washington, at the call of the President, May 22-24, have been published as Senate Document No. 151, 68th Congress. In it will be found the details of the first instance in which the moral, spiritual, and economic values of outdoor recreation have received formal recognition by the head of a great nation.

Flying Wood

[Continued from page 547]

been designed. It is especially suitable for high-speed planes. The plywood weighs a little more than the cloth, but the interior framework may be made somewhat less heavy, thus compensating for any increase in weight that may be caused by the use of plywood.

A few of the wooden parts used in airplanes are shown in the illustrations. Nearly all of these parts are made of spruce or ash or of plywood faced with birch or mahogany. There are scores of other wooden parts, but those illustrated are typical of the different kinds. It is noteworthy that many wooden parts are hollowed out, or are cut away in some form, wherever the stresses are not particularly great. This is done solely for the purpose of reducing the weight. The wing-webs, in particular, are made up mostly of circular or elliptical cut-outs. Another illustration shows the framework of an "art-metal" wing. It is almost an exact copy of a wooden wing. The two main longi-

tudinal members are the "wing-beams;" the fifteen cross-pieces, with numerous elliptical holes in them, are the webs. In another illustration, there are six unfinished propellers; the wooden "laminations" have been glued under heavy pressure and are ready to be carved into their final shape. Several types of airplanes are also shown; all of them are built of wood in so far as possible. In every case spruce is the principal wood that is used. On the completed airplanes not many wooden parts are visible, most of them being hidden inside of the fuselage and wings; the propellers, interplane struts, landing-gear struts, tail-skids, and the plywood sheathing on the fuselage are about the only wood parts that are exposed. (The forward portion of the fuselage, enclosing the engine, is in all cases sheathed with aluminum.) In order to decrease wind resistance, modern airplanes are "streamlined" and there are very few projecting parts of any kind.

IN SUMMER

By Alice E. Cartlidge

THERE'S a fresh wind blowing through the pines
Of a forest that's far away,
And its coaxing voice in the waving tops
Is calling to me today;
Calling me from the noisy town,
With its wearying hurry and work,
To the side of the stream and the fern-fringed pool,
Where the speckled brook trout lurk;

To the depths of a canyon, cool and dim,
With the shade of a thousand trees,
Where the steady rush of water hums
A song of content, and the breeze,
Pine-laden, blows softly and whispers to me
Of sunsets and soft summer rain—
Ah, the dream is so sweet, it is hard to awake
To the roar of the city again!



Moving Large Trees

[Continued from page 530]

quoted rule years ago. The trouble with this rule is that it is difficult to apply religiously. Many of the most beautiful estates in the older suburban sections of New York and Philadelphia, which were planted prior to 1900, have come to grief in their landscape effect because their plantings were originally done too closely, and the owners did not have the hardihood to cut out those trees which should have been eliminated.



ONE OF THE LARGE JAPANESE CHERRIES MOVED BY THE GOVERNMENT IN POTOMAC PARK. IT HAS JUST BEEN SWUNG CLEAR OF THE HOLE. THESE, TOO, WERE MOVED WITH A MINIMUM OF LOSS

There are many interesting examples of the transplanting of large trees. A striking one is that on the estate of James B. Duke at Somerville, New Jersey, where thousands of large trees were successfully transplanted. Another instance is the transplanting of a great many large trees on the Harvard Campus at Harvard University,

Cambridge, Massachusetts, following the destruction by the elm leaf beetle of many of the historic old elms that gave atmosphere to the college. After several attempts between 1910 and 1915 to replace these trees with small nursery trees, funds were donated by the alumni of Harvard for the transplanting, at a cost of about \$400 each, of large elms to replace the old Harvard elms. The trees were purchased in the vicinity of Cambridge and moved in, usually a tree each night, when the roads were free of traffic. Now, instead of the small, spindling elms which were first used, trees from one to two feet in diameter and in beautiful foliage stand as the successors of the old Harvard elms, and the work was accomplished during a period of a few weeks.

Illustrations accompanying this article show the successive steps in the moving of good-sized trees. Secured from various sources, a number of large and expensive boxwood and yew trees for placement at the Lincoln Memorial were moved by the Office of Public Buildings and Grounds, at Washington, D. C., under the direction of Col. C. S. Ridley and Lieut. Col. C. O. Sherrill, and the moving process was of intense interest to the residents and many visitors to the National Capital, each step in the operation having had an audience worthy of the infinite skill and patience required.

Of special interest was a transplanting in 1923, which might be said to have an international flavor, when the same office moved with great success a number of the large double-flowering Japanese cherry trees around the Speedway, in East Potomac Park. It will be recalled that these trees were the gift of the Japanese Government during the Taft administration; and now, each spring, at their annual flowering, when the curving drives of Potomac Park are lined with beauty and the wandering breezes cast drifts of blush-pink petals to rest on the green grass, these friendly trees from the "Land of the Cherry Blossom" are the center of attraction at the National Capital.

"Forest People"

[Continued from page 552]

Due largely to Evison's initiative the state authorities have begun to lay out a system of state parks, which already embrace 5,500 acres. One of these areas, Mount Moran, containing 2,900 acres, is said to be unparalleled in variety of scenic charm of mountain, sea, giant trees, and shore line. One of Evison's earnest efforts is to save strips of virgin timber along the state's highways.

Forest fires have no greater enemy than Herbert Evison. The blackened and charred remains of a forest fire inspire him to renew efforts to stop such economic and scenic waste. The sight of a great forest whipped to a desolate and forbidding destruction suggested to him the practical value of a special week to be observed annually as a further means of educating the public in the handling of fire in the forests. He made known his suggestion in the early spring of 1920. Its merit was immediately recognized and it was taken up and observed for the first time that same year.

Evison's creed of saving scenery is a rational and practical one. There is nothing of the so-called "crank" about him. He recognizes that the scenic side of America's out-of-doors is important and necessary, and he would fit its protection and preservation into a rational economic development. He is a practical newspaper man, too, and during the war was executive secretary of the state's war-time fuel administration. Evison believes not only in Washington's forests, but the forests of the nation and their protection from fire. He believes in the preservation of some of our matchless scenery and of strips of virgin timber along the highways. He would abolish the billboard evil, and he believes that outdoor life is as necessary to the full development of our American character as education itself. Add "Good Roads for the State" and you have the creed of the man who started Forest Protection Week.

ANOTHER STEP IN TREE SURGERY

Four years ago Bartlett perfected NuwuD—the new plastic filler for tree cavities. It is a permanent flexible filling, which avoids the evil results inseparable from the use of cement, especially in large cavities. NuwuD has since proved in thousands of trees the most striking single improvement in modern tree surgery.

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Psychology

[Continued from page 537]

Taylor River, with still five miles to go up a goat trail called an auto road, but the little ranger was still giving her the juice and trusting to luck.

"Mike was getting pretty nervous by now.

"Too many cattle in the road to drive fast in the dark," he said, and then squirmed up on top of the bed and squatted there all tense-like a big bullfrog ready to jump.

"Then an old bossy jumped kind of suddenly out in front of the car, and, Wham! we took her! Like a big bullfrog, Mike jumped, head first, hitting the road sort of lengthwise-like, mostly on his face and chest.

"W-wump," Mike said, when he hit, and it sounded sort of sickening-like, but he rolled like a trained puppy until he got out of reach of the car.

"After a while we got straightened out and got to the fire. We found the cow-punchers there, and they had corralled it before it got very big.

"Then we picked out a good burning stump and boiled a pot of coffee and fried a couple of big skilletts of bacon. As we ate, we talked about catching the guy who started the fire.

"We was all pretty sorelike. The cow-punchers was sore because they always put out their fires and didn't believe in nabobs and campers leaving theirs for somebody else to put out. The State Rangers and me was sore because we didn't had any sleep, and Mike was sore because he jumped! We sure would have had a lynching bee if we could catch the donkey who was so jackassish as to go off and leave his fire burning.

"Well, we had a clue. The cow-punchers said that the old man and his two boys, who were fighting the fire when they got there, said that a man driving a flea-bitten team had camped thereabouts the night before and then gone on up Taylor River.

"Yes," said the little ranger, 'thems the kind that leave their fires burning, and we'll go plumb to hell but what we catch him.'

"Then the State Rangers started out chasing the fire bug, the cow-punchers went home, and Mike and me started packing water to put out the fire. We packed water all night, and 'long about daylight the two State Rangers got back, sore'n ever. The man with the flea-bitten team had proved an alibi—he had camped up the creek a half mile the night before the fire started.

"Then I thought I'd try my luck.

"After we had drowned the fire good and packed up and started home, I told the little man to pull in at the first fishing camp, a mile below the fire.

"Know who started that fire?" I asked the old man, who came out of the tent with two boys as we drove up.

"No, I don't," he said; 'we saw the smoke about 2 o'clock in the afternoon and went up there with our buckets and shovels and worked 'till dark; then the cow-punchers come and we went home to get something to eat.'

"Then the old man related how he had come from the dusty city every summer for twenty-seven years and camped in this same spot on Taylor River and had never had a forest fire! You see, he was a Nature lover, with a vital longing for the old camp ground when the leaves get green in the spring. He talked it and looked it. You can tell 'em!

"The two boys stood watching me kind of suspicious like, so I turned to the biggest one.

"You fish?" I said kind of sudden:

"Yes—some," he sort of faltered.

"Do you smoke cigarettes?" I questioned.

"Y-yes," he admitted.

"Didn't you go fishing up the creek yesterday morning and smoke a cigarette along about where that fire started?" I asked, positive-like.

"I-I-I went fishing, but I didn't smoke any cigarettes up there," he sort of gulped out.

"Then I saw his lower lip kind of quivering, and I added tolerable quick:

"Will you take a bucket and go up there and pack water and watch that fire for two days and quit smoking cigarettes?"

"Yes, I will," he said, without hesitation, and started off on a lope for his bucket.

"We had drowned the fire most thoroughly, but, you see, I wanted that kid to learn his lesson. Twenty-seven summers, camping in the same spot, and no fires was a pretty good record for his daddy!

"The little ranger was in a hurry to get back to the flappers and counterjumpers, so we started home.

"Why didn't you cinch him?" the big ranger asked me, as we started down the goat trail. 'Couldn't you see you had him going?'

"Psychology," I said, sort of sleepy-like, 'might make a liar and a criminal out of that kid to pull him up before the judge.'

"But say! I haven't told all of my fire stories yet.

"A sheep herder started one last fall, and then calmly went on herding his sheep and let the fire burn; never tried to put it out or nothing! And I caught him and made him pack water all day on his back—two five-gallon water bags full at a load—and then took him down before the judge and he got fined and everything. Them's the kind a ranger likes to soak!"

The Company of Trees

(Collier's Comments Editorially.)

THE PATH slants into the woods past a vanguard of young pines, and slopes down into a glen lined with laurel bushes, growing between the rugged trunks of lofty trees. All about is a welcoming stillness, measured by the occasional crackle of a dry twig underfoot, or the clear call of a bird. The air is cool and spicy.

And the soft light, filtered through the leafy roof of the woods, is a benediction. Here is a place of renewal. Stillness is to the life of the mind as rest is to the body—in stillness the human spirit is strengthened and restored. Health is here for body and mind, amid the spicy silence, surrounded by the poised assurance of the towering trees.



September and October Planting

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Flowers of the High Places

[Continued from page 551]



A. H. Carhart

FIG. 32—ALPINE STEMLESS TOWNSENDIA (T. EXSCAPA)

been some such spot that lured blind Milton's cry:

"Where I may sit and rightly spell
Of every star that heav'n doth shew,
And every herb that sips the dew,
Till old experience do attain
To something like prophetick strain."

[For the illustrations the writer is indebted to the Forest Service: (1) Personal prints from the Forest Service photographic collection, and (2) drawings made for the Branch of Grazing, under his general supervision, by Mrs. Annie E. Hoyle, of the Forest Service. For the photographs from which Figs. 20 to 26 are made, the writer is indebted to Mr. A. H. Carhart, and Messrs. W. I. Hutchinson and D. C. Ingram, of the United States Forest Service.]

New Game Preserves in Georgia and Tennessee

About the middle of August President Coolidge signed a proclamation establishing two game preserves on the Cherokee National Forest in Tennessee and Georgia. One of these is in the Frog Mountain country, south of Ocoee River, in Polk County, Tenn., and takes in 30,000 acres acquired under the Weeks law. It is designated as Cherokee National Game Refuge No. 1. The other one covers about 14,000 acres on the watersheds of Noontootla and Rock Creeks, in northern Georgia, and will be known as Cherokee National Game Refuge No. 2. Both of these areas are well adapted to the propagation of deer, wild turkey and other game animals and birds and are not well stocked at present. The states of Georgia and Tennessee have passed laws harmonizing with game regulations to be issued by the U. S. Government and the preserves will be under the direct control of the forest supervisor at Knoxville, Tenn.

The Fire Situation in the West

MR. HENDERSON'S account of the forest-fire battle which has marked the summer months of California is descriptive of what is taking place throughout the West, and especially in Washington, Oregon, Montana, and Idaho. The widespread drought which began early in the spring has continued during the summer with insufficient rains to break the high fire hazard, which, as this is written, extends pretty generally along the Pacific coast and through the Rocky Mountain region. The first half of August saw no relief given to the drought-stricken areas, and the tinder-box character of the forests forced continued restrictive measures on the part of federal, state, and private agencies to prevent the spread of forest fires. The Forest Service not only closed eleven of the seventeen National Forests in California to public use, but, in order to protect public interests, took similar action in Washington, Oregon, Montana, and Idaho with respect to forests where the fire situation was abnormally hazardous.

While many bad fires have occurred and many are burning as this is written, it has been only by the adoption of extreme measures and the efficient co-operation of federal, state, and private organizations that the number of forest fires has been kept down and veritable holocausts in different parts of the West have been prevented.

"The terrible and never-to-be-forgotten forest fires of 1910 would, I feel sure, have been duplicated already this season if it had not been for the more efficient fire-fighting force of the Forest Service," said E. A. Sherman, Associate Forester.

"Even yet, with the two months of August and September ahead of us, we shall be fortunate if holocausts are prevented. The forests are like tinder boxes and extra precautionary methods are necessary. Heavy rains would be a godsend."

One of the most spectacular fires of the season was in the Arapaho National Forest, in northern Colorado, starting from a carelessly left camp fire. This blaze burned 2,500 acres in three hours, despite the fact that forest officers with a crew of men were fighting the flames within ten minutes after they started. Other spectacular fires have occurred on many of the California forests, one on the Shasta Forest having burned 1,000 acres in a single day. On August 4 four large fires were burning in California, but were reported under control.

During the last ten days of July 104 fires broke out on National Forest areas in Washington and Oregon. Even on some of the National Forests in Utah, Arizona, and New Mexico, where fires have been a rarity, many good-sized blazes have been reported.

Federal troops are aiding in the fight by patrolling areas which have been burned or which have been closed to all forms of public use. The Forest Service reports that it has spent \$530,000 since May 1 in hiring extra fire-fighters. These expenditures greatly exceeded those of last year for the same month. The expenditures during July were two and one-half times greater than for the preceding six months.

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Our Exhibit

DURING the recent meetings of the National Education Association in Washington, The American Forestry Association maintained a booth and exhibit with attendants at the desk during the entire session. It was very apparent, as evidenced by the great number of teachers who visited the booth seeking information on forestry and allied fields, that there is a wide demand for material which will aid the teacher in presenting these subjects to the children of the public schools. According to comments from those who use *AMERICAN FORESTS* and *FOREST LIFE* in their classes, the treatment of the subject from an economic angle, rather than one of purely nature study, adds special value to the magazine for use in the upper grades, while the popular manner in which the material is presented makes its appeal to the younger scholars as well as those in the more advanced classes.

It is estimated that more than eight thousand people visited the exhibit and almost half of these made the comment, "How good the cedar smells!" So a bit of the woods was brought to this great gathering of educators in conclave at the Nation's capital.



THE BOOTH OF THE AMERICAN FORESTRY ASSOCIATION AT THE RECENT NATIONAL CONVENTION OF EDUCATORS AT WASHINGTON, D. C.

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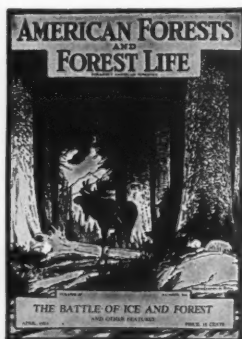
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AROUND THE STATES



GOVERNOR OF TENNESSEE FAVORS EXTENSIVE REFORESTATION PRO- GRAM

In addressing the University of Tennessee trustees recently, Governor Austin Peay laid down a program for constructive development of the state economically and socially.

Among the proposals listed were the following: "A million-dollar reforestation program, whereby hundreds of thousands of acres of cut-over lands will be reforested; the purchase of thousands of acres of cut-over lands surrounding the Herbert domain." If this legislation is consummated, it will be the first move on the part of the State of Tennessee toward the purchase of lands for state forests. The friends of forestry in the state are enthusiastic over the prospect and inspired by the Governor's ringing address.

PENNSYLVANIA REPEALS CHRIST- MAS TREE QUARANTINE

The Bureau of Plant Industry of the Pennsylvania State Department of Agriculture has issued a statement, effective June 20, 1924, repealing Pennsylvania Quarantine 12, promulgated October 5, 1923, and which forbade "the shipment, transportation, acceptance, receipt of sale, or other disposal in the Commonwealth of Pennsylvania of any coniferous trees, such as spruce, fir, hemlock, pine, juniper (cedar) and arbovitæ (white cedar), known and commonly described as 'Christmas trees,' and parts thereof, and also decorative plants, such as holly, laurel, and other plants, known and commonly described as 'Christmas greens' or 'greenery,' not nursery grown, that have been produced, grown, or cut from any of the New England States."

This action, it is explained, is taken because the U. S. Department of Agriculture, in a statement issued by the Secretary on January 21, 1924, announced regulations covering the subject of New England Christmas trees as follows:

"Christmas Trees, Domestic—The certification of Christmas trees for interstate movement from the region invaded by the gypsy moth in New England is to be continued to cover trees cut in that portion of the quarantine area designated as 'lightly infested,' but will be discontinued for the central area known as 'generally infested.'

"Christmas Trees, Canadian—The imports of Christmas trees from Canada will be brought under restrictions for the purpose of certification as to the district of origin and with provision for exclusion of trees from a district immediately north of the Vermont-New Hampshire border on account of the spread of the gypsy moth in these states practically to the Canadian line."

NATIONAL CONFERENCE ON OUT- DOOR RECREATION APPOINTS SECRETARY

The National Conference on Outdoor Recreation, which met in Washington May 22 to 24, at the call of President Coolidge, and which has as its purpose the correlation of the numerous activities relating to outdoor recreation now being conducted by many official and unofficial agencies, announces the selection of L. F. Kneipp to act as its executive secretary. Entering the Government service in Arizona in 1900 as a Forest Ranger under the Department of the Interior, Mr. Kneipp has since had a varied experience in forest work, serving at various times as a Ranger and Forest Supervisor in Arizona and New Mexico, as head of the Branch of Grazing, as District Forester in charge of the Intermountain District of the Forest Service, and finally as head of the Branch of Lands of the same service, in which position he has had charge of all recreation work on the National Forests. As executive secretary of the President's committee, he was closely associated with the initiation and development of the movement which culminated in the first meeting and the permanent organization of the conference.

IS THE BLISTER RUST IN CALIFORNIA?

With the hope of keeping the white-pine blister rust out of California, a co-operative agreement has just been signed by the California Department of Agriculture, State Board of Forestry, and the Federal Forest Service, whereby a survey of the state will be made, starting early in August. G. A. Root, Forest Service pathologist, will have charge of the investigation, which will cover, first, Modoc, Lassen, Siskiyou, Shasta, Trinity, Humboldt, and Del Norte counties. The disease is feared most in these sections.

BARKHAMSTEAD LIGHTHOUSE ADDED TO PEOPLE'S FOREST

The Connecticut Forestry Association has just published an attractive circular on the People's Forest. This forest is being purchased in Barkhamstead through private subscriptions. About 400 acres have been acquired to date, including the famous Lighthouse property. Years ago there was a settlement of log huts here inhabited by halfbreed Indians. When the stage driver saw the lights through the cracks, he spoke of it as the lighthouse. It became widely known by that name and was even designated on a map in the same way as the lighthouses on the shore.

NEW ASSISTANT FORESTER FOR NORTH CAROLINA

Harry Lee Baker has been appointed Assistant Forester of the North Carolina Geological and Economic Survey. He takes over the work formerly carried on by William Barrow Clark, whose untimely death a little over a year ago was such a loss to the service. The vacancy caused by Mr. Clark's death was hard to fill, and Mr. Baker was tendered the position after long consideration. He is a trained graduate in forestry, has had wide experience in the National Forests in the West, and comes to North Carolina after valuable experience in direction of the forestry work in the southwestern district of Virginia.



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BOOK REVIEWS

WESTERN FOREST TREES. By James Berthold Berry. World Book Company, 2126 Prairie Avenue, Chicago, Illinois.

Western Forest Trees adds another admirable text-book to the list of those prepared by Mr. Berry. Methods of classifying and identifying various representative woods are detailed, and the illustrations are so planned as to be shown in natural size, wherever possible. The effect of altitude and precipitation upon distribution of the commercially important trees of the West is described. The book should be of value to rancher and stockman of this region.

FORESTRY ALMANAC. Compiled and edited by the American Tree Association (Washington). J. B. Lippincott Co., Philadelphia, Pa. Price, \$2.00.

This volume was designed, in the words of the President of the American Tree Association, not as "a compendium of detailed statistics or scientific facts, but rather a volume to which all interested in forestry and conservation may find what has been done, what is being done, and what is yet to be done." Mention is made of the work of the various associations, forest schools, and government and state agencies interested in forestry, and the nations of the world are given some space, so that the book really accomplishes in a remarkable degree the purpose for which it was designed. It will be a fine idea if the figures can be brought up to date each year, since much of the information given necessarily will be obsolete in a short time. The compilers apparently overlooked a remarkable opportunity to add to the interest of the volume by including the astronomical data which is characteristic of all almanacs. By this means attention could be called to historic occurrences in our forestry program and suggestions given for planting, fire protection work, and legislative alertness at special dates throughout the year. The principal usefulness of the book lies in the fact that widely scattered information is made available in a single volume.

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PENNSYLVANIA COMPANY GROWS MINE TIMBER

The Reading Coal and Iron Company, of Pottsville, Pa., which control a hundred and fifty thousand acres of forest and abandoned farm lands that are suitable for growing trees, planted two hundred and forty thousand trees during the past season. Most of these were yellow and white pine. All the trees, except where disturbed by wandering bands of cattle, are doing well. Part of the stock was secured from the State, but a large portion of it was grown in nurseries operated by the company near Pottsville.

It is the announced intention of this company to keep up a vigorous program of planting on their lands, so that in the future it will not be necessary to bring mine timber from the Southern States, which at the present time greatly increases the cost of anthracite mining. This company is also active in fire-protection work and is following forest principles in cutting mine timbers from their present forests. They employ a forester and have a ranger organization.

Mention AMERICAN FORESTS and FOREST LIFE—It Helps

SUMMER MEETING OF ALLEGHENY SECTION OF SOCIETY OF AMERICAN FORESTERS

The summer meeting of the Allegheny Section of the Society of American Foresters was held on the Eastern Shores of Maryland on July 25 and 26, 1924. State Forester, F. W. Besley and Assistant Foresters Karl E. Pfeiffer, J. A. Cope, and F. B. Trenk acted as official guides. The visiting foresters report that they enjoyed one of the most interesting summer meetings in the history of the Allegheny Section. Fifty-one foresters, the largest number in the history of the Section, were in attendance. Each member of the party was supplied with a 10-page program and a map showing the route of the field trip.

Many interesting forest conditions and forest projects were inspected during the two days. Loblolly plantations established with nursery-grown and wild stock were seen, and different kinds of thinnings were also shown. Splendid examples of natural seeding in old fields were seen showing successful restocking as far as 500 feet from the seed tree. It was also demonstrated that controlled burning may insure successful regeneration. Abundant regeneration of loblolly pine was shown on a number of tracts that were burned over just prior to heavy seed years. The Maryland foresters are of the opinion that controlled burning gives satisfactory results, in that the removal of shade and exposure of mineral soil are essential for restocking pine lands. In many places the plan adopted is to remove the hardwoods and give preference to the pine. It is generally recommended that the hardwoods be allowed to grow until sufficiently large to cover the cost of removal, as well as subsequent planting. It was suggested that the hardwoods be removed in many places when about 15 years old, and in all cases vigorous 2-year planting stock should be used in planting work.

Individual staked trees located on sample plots showed that loblolly pine makes remarkable growth when young.

Other features of the trip included an introduction to several rare and interesting tree specimens.

ACREAGE ADDED TO NATIONAL FORESTS IN EAST AND SOUTH

The National Forest Reservation Commission, at a meeting held July 7, authorized the purchase of 102,236 acres of forest land, offered by 77 different owners in nine states, at an average price of \$4.16 per acre. In addition, the commission approved the extension of the Alabama National Forest so as to embrace 171,140 acres lying to the southward of the present boundary of that forest area, this acreage to be purchased in the future.

The purchases approved at the July 7 meeting of the commission bring the total area which is being acquired for National Forest purposes in the East up to 2,437,553.



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These purchases are made under authority of the Weeks Law, passed by Congress in 1911, which provides for the United States Department of Agriculture to acquire forest land in the East and South mainly for the protection of watersheds of navigable rivers. The provisions of the Weeks Law were greatly extended by the Clarke-McNary Law, passed by Congress last June.

The largest purchase approved by the commission is in Tennessee. It consists of 47,867 acres, of which 41,970 acres are in Monroe County, 4,000 in Unicoi County, and 1,224 acres in Cooke County.

In Pennsylvania the purchase of 2,445 acres was approved. This acreage lies in McKean, Forest, and Warren counties, which are located within the boundaries of the newly created Allegheny National Forest, designed to protect the headwaters of the Allegheny River, the most important tributary of the Ohio River from the north.

In West Virginia the purchase of 580 acres on the watershed of the Monongahela River and within the Monongahela National Forest was approved. In Virginia 5,454 acres within Rockingham and Augusta counties are to be purchased. In North Carolina 11,098 acres, consisting largely of a single tract in Transylvania County, will be purchased and will become a part of the Pisgah National Forest.

In South Carolina 18,921 acres of timberland in Oconee County will be acquired. This acreage is situated in such a manner that its acquisition will materially promote the solidification of the Nantahala National Forest.

In Arkansas 11,501 acres in Franklin, Stone, Pope, Newton, and Crawford counties were approved for purchase, the largest tract being 9,140 acres of cut-over forest land in Franklin County. In Georgia a small tract in Union County was approved, and in Alabama 4,001 acres in Lawrence and Winston counties will be purchased, which will materially aid in protecting the Alabama National Forest from fire.

PINNACLES NATIONAL MONUMENT ENLARGED

Through an executive order, President Coolidge has added 320 acres to the Pinnacles National Monument, California, upon recommendation of Secretary Work, of the Department of the Interior.

This monument was created by proclamation of the President in 1908 and enlarged in 1923 to 2,653 acres. The main feature of the monument, from which its name is derived, is the massing of spirelike rocks, which are visible for many miles in every direction. Under each group of rocks is a series of caves opening into one another.

The purpose of adding this new area to the monument is to make available to visitors to the monument a spring of clear water and some especially good camp sites, as well as to obviate the danger of the land being privately acquired and access to the monument by tourists blocked.

GENERAL FEDERATION OF WOMEN'S CLUBS COMPILES VALUABLE INFORMATION

State Forestry Today is the title of Bulletin No. 2, compiled by the Forestry Committee under the Department of Applied Education, of the General Federation of Women's Clubs. It contains an illuminating historical outline of the work of state federations in the interest of forestry, and indeed furnishes a splendid directory of associations, state departments, and schools which are prominent in the forestry movement.

GEORGIA EDITORS SUPPORT FORESTRY

Appreciating the fact that Georgia is having to import lumber from other states, that there is too much promiscuous burning of the Georgia woods, and anxious to secure the co-operation of the United States Government in State forestry matters, the Georgia Press Association, meeting recently at Waycross, unanimously advocated the passage of the Roundtree-Haddock Forestry Bill, now before the legislature. The principal features of the bill are the provision for the prevention and suppression of forest fires in the state and for aid to farmers in the reforestation of their idle lands.

FOREST SERVICE TO ISSUE BI- MONTHLY PERIODICAL

In order to circulate news of a strictly forestry nature throughout the state departments, forest schools, National Forest districts, and experiment stations, the Forest Service has decided to issue a periodical in the nature of a news letter, to be called *The Forest Worker*. The first issue will appear September 1. Short, pithy items, personals, and short articles of fresh current interest in forestry work will be emphasized. An appeal has been issued by the Forest Service for the hearty co-operation of all agencies, so that the particular field chosen by this publication may be thoroughly covered.

ALABAMA STARTS FARM FORESTRY

The Alabama Commission of Forestry announces that Mr. Charles F. Fuechsel, an agent of the Commission, has been assigned to the work of assisting farmers and other owners of small forest areas in connection with handling and developing their woodland holdings. The value of farm woodlands is often overlooked by the owners. A small timber tract is extremely useful to the owner, not only in furnishing him with lumber and wood material for use on the farm, but it also in many cases comprises an alternate source of employment for the owner. Instruction, demonstration, advice, and assistance in managing woodlands will comprise the principal

duties of Mr. Fuechsel. He will also be prepared to give advice in connection with the marketing of forest products from small holdings. The aid extended to the owners of small tracts by the State Commission of Forestry is without cost to the landowners.

NEW ALASKA FISHERY LAW AND REGULATIONS

The Alaska fisheries bill, which passed the House of Representatives on April 9 with amendments, was passed by the Senate on May 26 with further modifications. The conference report on the bill was accepted by both Houses, and the act was approved by the President on June 6. On June 7 the President issued executive orders revoking the executive orders of February 17 and November 3, 1922, which had created the Alaska Peninsula Fisheries Reservation and the Southwestern Alaska Fisheries Reservation respectively. All permits for fishing within those reservations under the regulations which had been issued are now canceled.

Important features of the law are the power lodged in the Secretary of Commerce to create areas in which fishing may be limited or entirely prohibited, as the circumstances warrant, the extension of the jurisdiction of the Secretary to the full extent of territorial waters, and the imposition of the weekly closed period on fishing in the Bristol Bay region, Cook Inlet, and the Copper River Delta, which were formerly excepted from this limitation.

LOUISIANA STARTS REFORESTATION OF 14,810 ACRES

Commissioner Berwick, of the Department of Conservation, has announced the acceptance of 14,810 acres of denuded lands of the Great Southern Lumber Company, to be placed under the reforestation contract in accordance with section 11 of Act 90 of 1922.

This cut-over area of the Great Southern Lumber Company was inspected by the State Forester, V. H. Sonderegger. The Great Southern Lumber Company now has approximately 70,000 acres of denuded lands under reforestation with the state and enjoys a unique distinction of having the largest single reforestation area in this country.

The Great Southern Lumber Company in its contract agrees to reforest these lands artificially or naturally, as the case may be. All of the lands under the contract have been completely denuded of timber with the exception of small seed trees averaging two to four to the acre. Many sections of this large area are completely denuded of seed trees and must be developed through planting of seedlings. To meet this condition, the Great Southern has this year established one of the largest nurseries that has ever been attempted by an individual.

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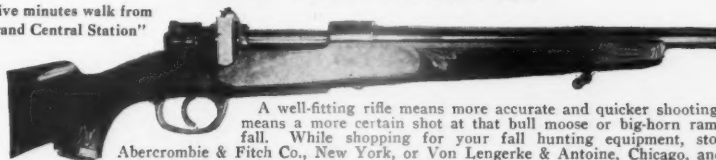
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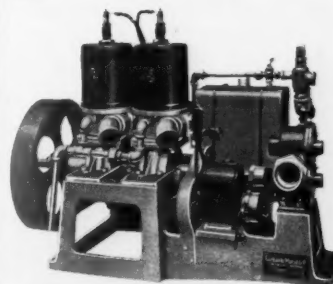
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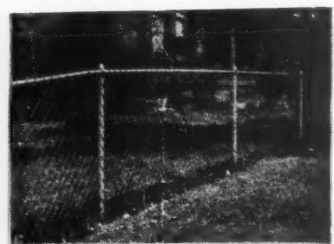


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CO-OPERATIVE FIRE PROTECTION GETS UNDER WAY IN ALABAMA

A check for \$2,197.16 has been received by the State Commission of Forestry from the United States Forest Service. This sum represents a reimbursement to the State of a portion of its expenditures in connection with forest-fire prevention. This is in accordance with a co-operative agreement entered into between the State and the Federal Government on March 1 of this year. The entire country requires timber for building purposes and in connection with the wood-using industries. Most of the forests are now situated in the Southern States and in the Pacific Northwest. Many states have no commercial forests whatever, and the only way that they can contribute toward perpetuating the timber supply in which they are interested is through the Federal Government. Thus not only the local communities, but also the state as a whole and the nation at large, are actively engaged in solving the problem of future timber supply.

A UNIQUE JOB

Counting lightning bolts as they strike and set fire among the mountain forests is the latest job of the United States Forest Service fire lookouts stationed on high peaks in the Sierra Mountains of California and the northern Rockies of Idaho and Montana.

"A single lightning storm will sometimes cause over 300 forest fires in the National Forests of California," said Mr. Kotok, "and these bunched fires in the high mountain country cause the breakdown of the fire-protective organization. If we can predict lightning storms even four or five hours in advance, we can mobilize cattlemen, prospectors, woodsmen, sheepherders, and other residents of the mountains to help put out the multitude of fires the lightning sets."

Hundreds of fire lookouts in the western mountains have been instructed by the Forest Service to keep records of lightning storms, the place of origin, their direction, the number of bolts of lightning, and the number of fires set.

CALIFORNIA FORESTER ESTIMATES 65 PER CENT OF CUT-OVER LANDS NOW REPRODUCING

That some 65 per cent of the 3,438,000 acres of cut-over forest land in California are capable of producing a second growth of pine timber of a value approximating that of the original crops is, in the opinion of Silviculturist S. B. Show, of the United States Forest Service, evidence that reckless logging methods and careless or uninformed control of fire on California's forest lands have not entirely deprived future generations of the timber crops they must harvest if this part of our country is to maintain its present well-being.

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The New York State College of Forestry Syracuse University Syracuse, N. Y.

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For further information and catalogue address: The Dean of the School of Forestry, New Haven, Connecticut, U. S. A.

"Over a third of the forest land, however, that has been cut over by lumber companies, or by pulp and paper companies, railroads, sheep and cattle men, mining companies, and others during the past quarter century now lies idle and unproductive," remarked Mr. Show in the course of a recent discussion of the subject. "Grown up, as it is, to a dense stand of brush, it is indeed a positive menace to near-by timber, for the forest fires in these brush fields are as uncontrollable as are the disastrous fires common in other regions. Indeed, such fires can rarely be confined strictly to the brush-covered lands themselves. Of the total 1,188,000 acres of non-producing land, some 600,000 acres in round figures will have some growth in course of time, amounting to about one-fifth of the possible stocking of timber—not enough to make commercial lumbering a possibility. Within 75 years, however, if fire is kept out and reseedling is normal, an adequate forest growth should be well under way. For the rest, only planting will make it possible for them to produce timber of any kind, even within the next century or so."

BRUSH BURNING CAUSES MANY FIRES

An average of 41,503 forest fires a year for the past eight years is the record for the United States, according to recent figures issued by the Forest Service. In order of numbers, the causes are:

	Fires	Per Cent
Unknown	7,456	18
Incendiary	7,038	17
Campers and smokers.....	6,676	16.1
Brush burning.....	6,032	14.5
Railroads	5,714	13.8
Lightning	3,197	7.7
Miscellaneous	2,959	7.1
Lumbering	2,431	5.8
	41,503	100.0

One rather remarkable thing about these statistics is the enormous increase in the number of fires from brush burning. This is noticeable in the States of Alabama, Florida, Mississippi, Georgia, South Carolina, Missouri, Arkansas, Oklahoma, Minnesota, and Wisconsin. Most of the brush-burning fires are the result of operations in connection with agriculture. The Western States, where present losses are greatest, this year are not suffering so much from this particular cause.

HEADS FOREST EXTENSION WORK IN GEORGIA

Prof. Du Pre Barrett, of the Georgia State Forest School of Athens, has been selected as Extension Specialist in Forestry by the Extension Service of the State College of Agriculture. A demand for the

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ATTENTION, FORESTERS!

AMERICAN FORESTS AND FOREST LIFE will print, free of charge in this column, advertisements of foresters wanting positions, or of persons having employment to offer foresters.

POSITIONS WANTED

GRADUATE FORESTER, B. S., M. S. E., Michigan University, 11 years' experience with U. S. Forest Service in California, Idaho, and Montana; one year railroad location and construction work; wishes position with lumber company or state service as forester or logging engineer. References furnished if desired. Address Box 7060, care AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (5-7-24)

FORESTER-LAWYER, studied at two forest schools and law-school graduate. Studied commerce one year at university. At present engaged in graduate study of economics as related to forestry at an eastern university. Desires to locate with a forest-products concern where a knowledge of both law and forestry will be useful. Interview desired. Available June 15th. Address Box 7065, care AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (5-7-24)

FOREST SCHOOL GRADUATE with some forest experience in the West and with training and wide experience in horticulture, including tree surgery, desires to return to forestry; either state, private, or municipal; preferably the latter. Forest experience includes blister-rust work with the U. S. Government. Full particulars and references given on request. Address Box 7070, AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (6-8-24)

YOUNG MAN, 18 years of age, high-school graduate, desires work in hardwood forests. Would like work which will give experience in practical application of forestry. Address Box 7080, care of AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (6-8-24)

GRADUATE FORESTER, B. S., Michigan Agricultural College, wants position with a pulp or lumber company as forester or forest engineer. Prefers northern location. At present employed in cypress operation. References. Address Box 7085, care of AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (7-9-24)

ESTATE FORESTER, wants position with nursery or estate. Has had varied experience in British Isles. Can furnish references as to industry, ability, and character. World War veteran. Anxious to get to work. Address Box 8000, care AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (9-11-24)

GRADUATE FORESTER, B. S. degree in Western University, desires position with state lumber company or private estate. Several years' experience with U. S. Forest Service and private companies in West. Prefers southern or western location. References and full particulars on request. Address Box 8010, care AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (9-11-24)

GRADUATE of one of the leading eastern forest schools wants permanent selling position with concern dealing in forest products or nursery stock. Details and references furnished on request. Address Box 8025, care AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (9-11-24)

services of a forester in Georgia has steadily increased with the campaign made during the past two years for a State Forestry Department. Professor Barrett is well informed on Georgia conditions, having taught for some time in the State Forest School. He has made notable contributions to the study of logging.

HARDWOODS USED IN AUTOMOBILE MANUFACTURE

Nearly a billion and a quarter board feet of hardwoods were used in 1923 in the manufacture of motor vehicles, according to the last annual report of the National Automobile Chamber of Commerce in its tabulation of "raw materials used." The tabulation lists 1,163,232,000 feet of hardwoods used, or 14 per cent of the total hardwood production (their estimate); also 300,121,000 feet of softwood lumber crating for railroad shipments and exports. The manufacture of motor vehicles in 1923 consumed 80 per cent of all the rubber produced, 53 per cent of the plate glass, 69 per cent of the leather, and nearly 10 per cent of the copper. Automobile production in 1923 is given as 4,086,997 vehicles—a gain of 53 per cent over 1922.

GRADUATE FORESTER with 14½ years' practical experience in all phases of forestry work—cruising and lumbering from stump to car—wishes position with lumbering company, coal company, state, or person owning large estates. Best of references furnished on request. Address Box 7090, care of AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (7-9-24)

GRADUATE FORESTER, with degree Bachelor of Forestry, desires position with state, lumber company, or private estate. Has several years of experience as State Forester, and later experience in city forestry and private work. References and details furnished upon request. Address Box 7095, care of AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (8-10-24)

WANTED—Forestry or Tree Surgery work by able-bodied man. Personal qualifications cover three years' practical experience in surgery and forestry. Well educated, analytical ability. Good appearance and personality. Address Box 8015, care of AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (9-11-24)

FORESTER—Age 28, Yale B. A., M. F., three years' graduate work—desires position in forest research or other forestry work, preferably in the Northeast. Available October 15th. References furnished on request. Address Box 8020, care of AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (9-11-24)

HELP WANTED

POSITION OPEN in State forestry department October 1, paying from \$2,000 to \$2,500. Applicant must be a technically trained forester with some experience in fire protection work under eastern conditions. He must be capable of directing a state-wide protection system. Address Box 8500, care of AMERICAN FORESTS AND FOREST LIFE, Washington, D. C. (9-11-24)

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6-7" "	65 "

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